SPARC T5-2 Server Service Manual

Part No: E28856-10
July 2015

Part No: E28856-10

Copyright © 2013, 2015, Oracle and/or its affiliates. All rights reserved.

This software and related documentation are provided under a license agreement containing restrictions on use and disclosure and are protected by intellectual property laws. Except as expressly permitted in your license agreement or allowed by law, you may not use, copy, reproduce, translate, broadcast, modify, license, transmit, distribute, exhibit, perform, publish, or display any part, in any form, or by any means. Reverse engineering, disassembly, or decompilation of this software, unless required by law for interoperability, is prohibited.

The information contained herein is subject to change without notice and is not warranted to be error-free. If you find any errors, please report them to us in writing.

If this is software or related documentation that is delivered to the U.S. Government or anyone licensing it on behalf of the U.S. Government, then the following notice is applicable:

U.S. GOVERNMENT END USERS. Oracle programs, including any operating system, integrated software, any programs installed on the hardware, and/or documentation, delivered to U.S. Government end users are "commercial computer software" pursuant to the applicable Federal Acquisition Regulation and agency-specific supplemental regulations. As such, use, duplication, disclosure, modification, and adaptation of the programs, including any operating system, integrated software, any programs installed on the hardware, and/or documentation, shall be subject to license terms and license restrictions applicable to the programs. No other rights are granted to the U.S. Government.

This software or hardware is developed for general use in a variety of information management applications. It is not developed or intended for use in any inherently dangerous applications, including applications that may create a risk of personal injury. If you use this software or hardware in dangerous applications, then you shall be responsible to take all appropriate fail-safe, backup, redundancy, and other measures to ensure its safe use. Oracle Corporation and its affiliates disclaim any liability for any damages caused by use of this software or hardware in dangerous applications.

Oracle and Java are registered trademarks of Oracle and/or its affiliates. Other names may be trademarks of their respective owners.

Intel and Intel Xeon are trademarks or registered trademarks of Intel Corporation. All SPARC trademarks are used under license and are trademarks or registered trademarks of SPARC International, Inc. AMD, Opteron, the AMD logo, and the AMD Opteron logo are trademarks or registered trademarks of Advanced Micro Devices. UNIX is a registered trademark of The Open Group.

This software or hardware and documentation may provide access to or information about content, products, and services from third parties. Oracle Corporation and its affiliates are not responsible for and expressly disclaim all warranties of any kind with respect to third-party content, products, and services unless otherwise set forth in an applicable agreement between you and Oracle. Oracle Corporation and its affiliates will not be responsible for any loss, costs, or damages incurred due to your access to or use of third-party content, products, or services, except as set forth in an applicable agreement between you and Oracle.

Documentation Accessibility

For information about Oracle's commitment to accessibility, visit the Oracle Accessibility Program website at `http://www.oracle.com/pls/topic/lookup?ctx=acc&id=docacc`.

Access to Oracle Support

Oracle customers that have purchased support have access to electronic support through My Oracle Support. For information, visit `http://www.oracle.com/pls/topic/lookup?ctx=acc&id=info` or visit `http://www.oracle.com/pls/topic/lookup?ctx=acc&id=trs` if you are hearing impaired.

Référence: E28856-10

Copyright © 2013, 2015, Oracle et/ou ses affiliés. Tous droits réservés.

Ce logiciel et la documentation qui l’accompagne sont protégés par les lois sur la propriété intellectuelle. Ils sont concédés sous licence et soumis à des restrictions d’utilisation et de divulgation. Sauf stipulation expresse de votre contrat de licence ou de la loi, vous ne pouvez pas copier, reproduire, traduire, diffuser, modifier, breveter, transmettre, distribuer, exposer, exécuter, publier ou afficher le logiciel, même partiellement, sous quelque forme et par quelque procédé que ce soit. Par ailleurs, il est interdit de procéder à toute ingénierie inverse du logiciel, de le désassembler ou de le décompiler, excepté à des fins d’interopérabilité avec des logiciels tiers ou tel que prescrit par la loi.

Les informations fournies dans ce document sont susceptibles de modification sans préavis. Par ailleurs, Oracle Corporation ne garantit pas qu’elles soient exemptes d’erreurs et vous invite, le cas échéant, à lui en faire part par écrit.

Si ce logiciel, ou la documentation qui l’accompagne, est concédé sous licence au Gouvernement des Etats-Unis, ou à toute entité qui délivre la licence de ce logiciel ou l’utilise pour le compte du Gouvernement des Etats-Unis, la notice suivante s’applique:

U.S. GOVERNMENT END USERS. Oracle programs, including any operating system, integrated software, any programs installed on the hardware, and/or documentation, delivered to U.S. Government end users are "commercial computer software" pursuant to the applicable Federal Acquisition Regulation and agency-specific supplemental regulations. As such, use, duplication, disclosure, modification, and adaptation of the programs, including any operating system, integrated software, any programs installed on the hardware, and/or documentation, shall be subject to license terms and license restrictions applicable to the programs. No other rights are granted to the U.S. Government.

Ce logiciel ou matériel a été développé pour un usage général dans le cadre d’applications de gestion des informations. Ce logiciel ou matériel n’est pas conçu ni n’est destiné à être utilisé dans des applications à risque, notamment dans des applications pouvant causer des dommages corporels. Si vous utilisez ce logiciel ou matériel dans le cadre d’ applications dangereuses, il est de votre responsabilité de prendre toutes les mesures de secours, de sauvegarde, de redondance et autres mesures nécessaires à son utilisation dans des conditions optimales de sécurité. Oracle Corporation et ses affiliés déclinent toute responsabilité quant aux dommages causés par l’utilisation de ce logiciel ou matériel pour ce type d’applications.

Oracle et Java sont des marques déposées d’Oracle Corporation et/ou de ses affiliés. Tout autre nom mentionné peut correspondre à des marques appartenant à d’autres propriétaires qu’Oracle.

Intel et Intel Xeon sont des marques ou des marques déposées d’Intel Corporation. Toutes les marques SPARC sont utilisées sous licence et sont des marques ou des marques déposées de SPARC International, Inc. AMD, Opteron, le logo AMD et le logo AMD Opteron sont des marques ou des marques déposées d’Advanced Micro Devices. UNIX est une marque déposée d’The Open Group.

Ce logiciel ou matériel et la documentation qui l’accompagne peuvent fournir des informations ou des liens donnant accès à des contenus, des produits et des services émanant de tiers. Oracle Corporation et ses affiliés déclinent toute responsabilité ou garantie expresse quant aux contenus, produits ou services émanant de tiers, sauf mention contraire stipulée dans un contrat entre vous et Oracle. En aucun cas, Oracle Corporation et ses affiliés ne sauraient être tenus pour responsables des pertes subies, des coûts occasionnés ou des dommages causés par l’accès à des contenus, produits ou services tiers, ou à leur utilisation, sauf mention contraire stipulée dans un contrat entre vous et Oracle.

Accessibilité de la documentation

Pour plus d’informations sur l’engagement d’Oracle pour l’accessibilité à la documentation, visitez le site Web Oracle Accessibility Program, à l'adresse `http://www.oracle.com/pls/topic/lookup?ctx=acc&id=docacc`.

Accès au support électronique

Les clients Oracle qui ont souscrit un contrat de support ont accès au support électronique via My Oracle Support. Pour plus d'informations, visitez le site `http://www.oracle.com/pls/topic/lookup?ctx=acc&id=info` ou le site `http://www.oracle.com/pls/topic/lookup?ctx=acc&id=trs` si vous êtes malentendant.

Contents

Using This Documentation 11
  Product Documentation Library 11
  Feedback 11

Identifying Components 13
  Front Panel Components (Service) 13
  Rear Panel Components (Service) 15
  Internal Component Locations 16
  Motherboard Component Locations 19
  I/O Component Locations 20
  Power Distribution and Fan Module Component Locations 22
  System Schematic 23
  Component Task Reference 26

Detecting and Managing Faults 29
  Understanding Diagnostics 29
    Diagnostics Process 29
    Tool Availability 31
    ▼ Log In to Oracle ILOM (Service) 32
    Oracle ILOM Service-Related Tools 32
  Interpreting LEDs 33
    Front Panel Controls and LEDs 34
    Rear Panel Controls and LEDs 36
  Configuring POST 37
    POST Overview 38
    Oracle ILOM Properties That Affect POST Behavior 38
    ▼ Configure POST 40
    ▼ Run POST With Maximum Testing 42
  Managing Faults 42
    PSH Overview 43

- ▼ Check for Faults 43
- ▼ Clear a Fault 45

Interpreting Log Files and System Messages 46

- ▼ Check the Message Buffer 46
- ▼ View Log Files (Oracle Solaris) 47
- ▼ View Log Files (Oracle ILOM) 47

Preparing for Service 49

Safety Information 49

Safety Symbols 50

ESD Measures 50

Antistatic Wrist Strap Use 50

Antistatic Mat 51

Tools Needed For Service 51

Filler Panels 51

- ▼ Find the Server Serial Number 52
- ▼ Locate the Server 52

Component Service Categories 53

Removing Power From the Server 54

- ▼ Prepare to Power Off the Server 55
- ▼ Power Off the Server (Oracle ILOM) 55
- ▼ Power Off the Server (Power Button - Graceful) 56
- ▼ Power Off the Server (Emergency Shutdown) 56
- ▼ Disconnect Power Cords 57

Accessing Server Components 57

- ▼ Prevent ESD Damage 58
- ▼ Extend the Server to the Service Position 58
- ▼ Release the CMA 60
- ▼ Remove the Server From the Rack 61
- ▼ Remove the Top Cover 62

Attachment of Devices During Service 63

Servicing Drives 65

Drive LEDs 66

- ▼ Locate a Faulty Drive 67
- ▼ Remove a Drive 67
- ▼ Remove a Drive Filler Panel 70
- ▼ Install a Drive 71
- ▼ Install a Drive Filler Panel 73

▼ Verify Drive Functionality 74

Servicing Fan Modules 77
Fan Module LEDs 78
▼ Locate a Faulty Fan Module 78
▼ Remove a Fan Module 79
▼ Install a Fan Module 81
▼ Verify Fan Module Functionality 82

Servicing Power Supplies 85
Power Supply LEDs 85
▼ Locate a Faulty Power Supply 87
▼ Remove a Power Supply 87
▼ Install a Power Supply 89
▼ Verify Power Supply Functionality 90

Servicing Memory Risers and DIMMs 91
Memory Riser and DIMM FRU Names 91
Memory Riser and DIMM Configuration 93
DIMM Rank Classification Labels 94
▼ Locate a Failed DIMM (LEDs) 94
▼ Locate a Failed DIMM (Oracle ILOM) 96
▼ Remove a Memory Riser and DIMM 96
▼ Install a DIMM and a Memory Riser 99
▼ Enable and Verify Newly Installed DIMMs 102

Servicing the DVD Drive 105
▼ Remove a DVD Drive or Filler Panel 105
▼ Install a DVD Drive or Filler Panel 106

Servicing the Battery 109
▼ Remove the Battery 109
▼ Install the Battery 110

Servicing PCIe Cards 113
PCIe Card Configuration 113
I/O Root Complex Connections 114
▼ Remove a PCIe Card or Filler Panel 115

▼ Install a PCIe Card or Filler Panel 117

Servicing the SP 121
SP Firmware and Configuration 121
▼ Remove the SP 122
▼ Install the SP 123
▼ Verify SP Functionality 125

Servicing the Fan Board 127
▼ Remove the Fan Board 127
▼ Install the Fan Board 129
▼ Verify Fan Board Functionality 131

Servicing the Motherboard 133
▼ Remove the Motherboard 133
▼ Install the Motherboard 138
▼ Reactivate RAID Volumes 144
▼ Verify Motherboard Functionality 146

Servicing the Drive Backplane 147
▼ Remove the Drive Backplane 147
▼ Install the Drive Backplane 149
▼ Verify Drive Backplane Functionality 151

Servicing the PS Backplane 153
▼ Remove the PS Backplane 153
▼ Install the PS Backplane 155
▼ Verify PS Backplane Functionality 157

Returning the Server to Operation 159
▼ Replace the Top Cover 159
▼ Return the Server to the Normal Operating Position 160
▼ Attach Power Cords 161
▼ Power On the Server (Oracle ILOM) 162
▼ Power On the Server (Power Button) 162

Glossary 165

Index 171

Using This Documentation

- **Overview** – Describes how to troubleshoot and maintain the SPARC T5-2 server from Oracle.
- **Audience** – Technicians, system administrators, and authorized service providers.
- **Required knowledge** – Advanced experience troubleshooting and replacing hardware.

Product Documentation Library

Documentation and resources for this product and related products are available at `http://www.oracle.com/goto/t5-2/docs`.

Feedback

Provide feedback about this documentation at `http://www.oracle.com/goto/docfeedback`.

Identifying Components

These topics identify key components of the server, including major boards and internal system cables, as well as front and rear panel features.

- "Front Panel Components (Service)" on page 13
- "Rear Panel Components (Service)" on page 15
- "Internal Component Locations" on page 16
- "Motherboard Component Locations" on page 19
- "I/O Component Locations" on page 20
- "Power Distribution and Fan Module Component Locations" on page 22
- "System Schematic" on page 23
- "Component Task Reference" on page 26

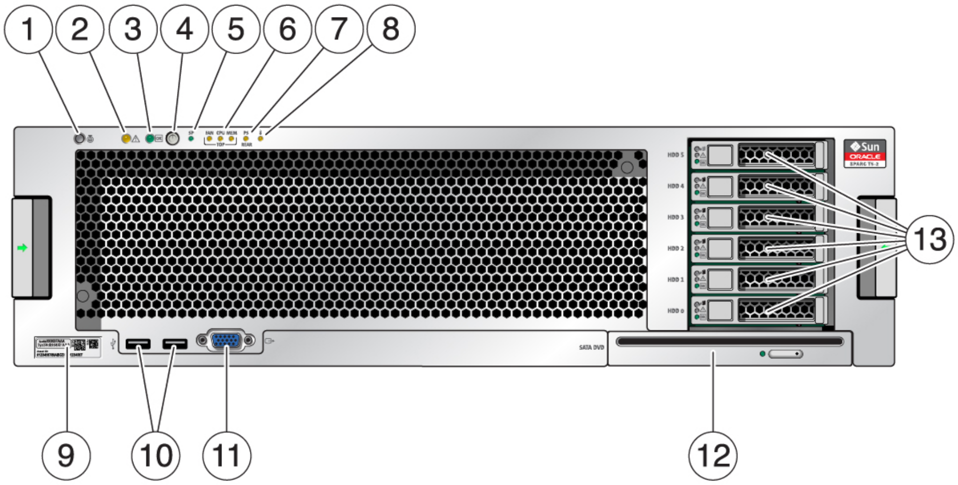
Related Information

- "Detecting and Managing Faults"
- "Preparing for Service"

Front Panel Components (Service)

The following figure shows the layout of the server front panel, including the power and server locator buttons and the various status and fault LEDs.

Note - The front panel also provides access to internal drives, the removable media drive (if equipped), and the two front USB ports.

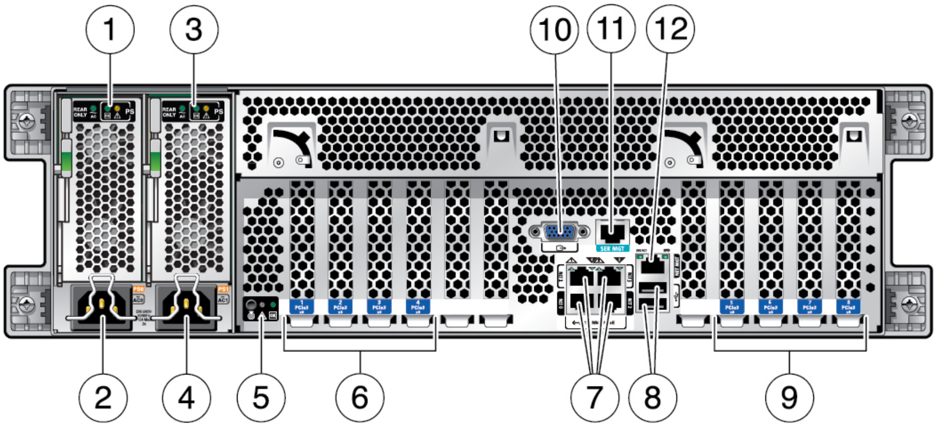


No.	Description	Links
1	Locator LED/Locator button (white)	"Front Panel Controls and LEDs" on page 34
2	Service Action Required LED (amber)	"Front Panel Controls and LEDs" on page 34
3	Power/OK LED (green)	"Front Panel Controls and LEDs" on page 34
4	Power button	"Front Panel Controls and LEDs" on page 34
5	SP OK/Fault LED (green or amber)	"Front Panel Controls and LEDs" on page 34 "Servicing the SP"
6	Three Service Action Required LEDs (amber) for Fan Module (FAN), Processor (CPU), and Memory (MEM)	"Servicing Fan Modules" "Servicing the Motherboard" "Servicing Memory Risers and DIMMs"
7	Power Supply (PS) Fault (Service Action Required) LED (amber)	"Servicing Power Supplies"
8	Overtemperature LED (amber)	"Front Panel Controls and LEDs" on page 34
9	Serial number	
10	Two USB 2.0 connectors	*Server Installation*, USB port
11	HD-15 video connector	*Server Installation*, video port
12	SATA DVD drive	"Servicing the DVD Drive"
13	Drives 0 to 5 (numbered bottom to top)	"Servicing Drives"

Related Information

- “Rear Panel Components (Service)” on page 15
- “Rear Panel Components (Service)” on page 15
- “Motherboard Component Locations” on page 19
- “I/O Component Locations” on page 20
- “Power Distribution and Fan Module Component Locations” on page 22
- “System Schematic” on page 23

Rear Panel Components (Service)



No.	Description	Links
1	Power supply 0 status indicator LEDs	“Servicing Power Supplies”
2	Power supply 0 AC inlet	
3	Power supply 1 status indicator LEDs	“Servicing Power Supplies”
4	Power supply 1 AC inlet	
5	Server status LEDs	“Rear Panel Controls and LEDs” on page 36
6	PCIe card slots 1 to 4	“Servicing PCIe Cards”
7	10GbE Network (NET) 100/1000/10000 Mbps ports (4): NET0 to NET3	
8	USB 3.0 connectors (2)	
9	PCIe card slots 5 to 8	“Servicing PCIe Cards”
10	HD-15 video connector	
11	Serial management (SER MGT) RJ-45 serial port	

No.	Description	Links
12	SP network management (NET MGT) port	

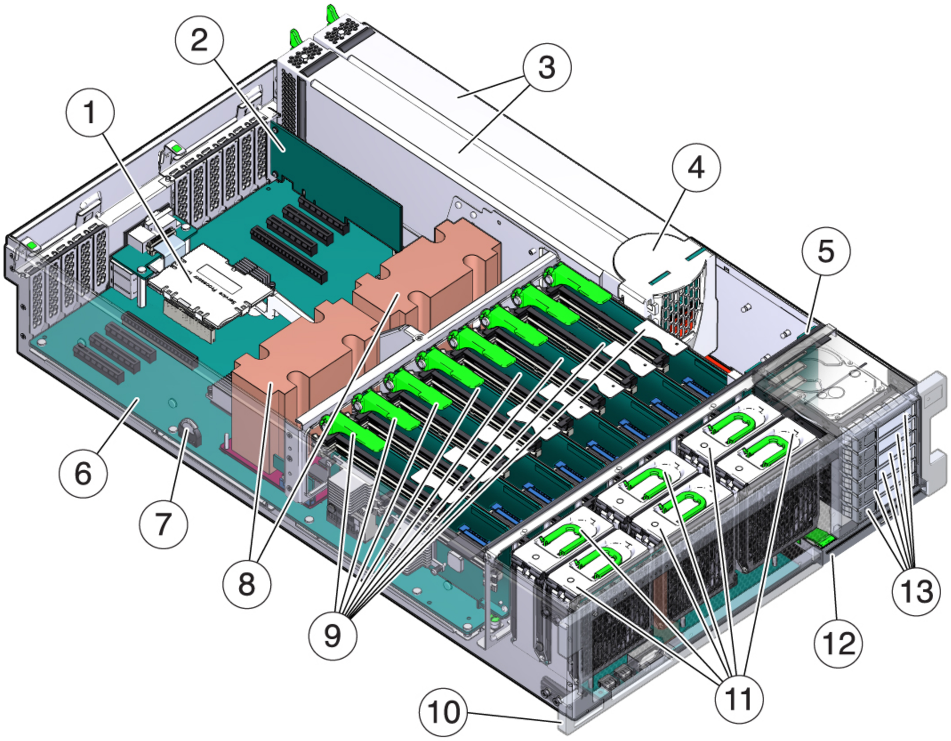
Related Information

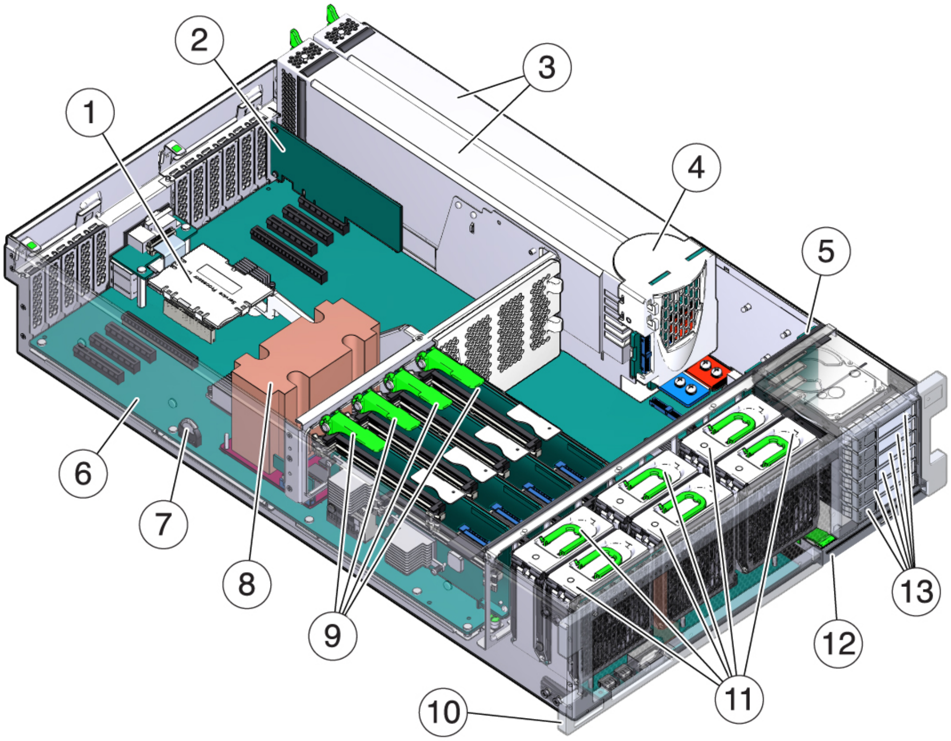
- "Front Panel Components (Service)" on page 13
- "Internal Component Locations" on page 16
- "System Schematic" on page 23

Internal Component Locations

The following figures identify the replaceable component locations with the top cover removed.

Note - The 2-processor server has eight memory risers. The 1-processor server has four memory risers.





This table applies to both the 2-processor server and the 1-processor server.

No.	Component	Oracle ILOM Target	Links
1	SP	`/SYS/MB/SP`	“Servicing the SP”
2	PCIe card (in slot 1)	`/SYS/MB/PCIE1`	“Servicing PCIe Cards”
		`/SYS/MB/PCIE2`	
		`/SYS/MB/PCIE3`	
		`/SYS/MB/PCIE4`	
		`/SYS/MB/PCIE5`	
		`/SYS/MB/PCIE6`	
		`/SYS/MB/PCIE7`	
		`/SYS/MB/PCIE8`	
3	Power supplies	`/SYS/PS0` (outer)	“Servicing Power Supplies”
		`/SYS/PS1` (inner)	
4	PS backplane and cover	`/SYS/PDB`	“Servicing the PS Backplane”

No.	Component	Oracle ILOM Target	Links
5	Drive backplane	`/SYS/SASBP`	"Servicing the Drive Backplane"
6	Motherboard	`/SYS/MB`	"Servicing the Motherboard"
7	Battery	`/SYS/MB/BAT`	"Servicing the Battery"
8	Processor modules and heat sinks (these are only replaceable by replacing the motherboard) * This processor module is not present on the 1-processor server	`/SYS/MB/CM0` `/SYS/MB/CM1*`	"Servicing the Motherboard"

9	Memory risers
	* These memory risers are not present in the 1-processor server
		`/SYS/MB/CM0/CMP/MR0`
		`/SYS/MB/CM0/CMP/MR1`
		`/SYS/MB/CM0/CMP/MR2`
		`/SYS/MB/CM0/CMP/MR3`
		`/SYS/MB/CM1/CMP/MR0*`
		`/SYS/MB/CM1/CMP/MR1*`
		`/SYS/MB/CM1/CMP/MR2*`
		`/SYS/MB/CM1/CMP/MR3*`
			"Servicing Memory Risers and DIMMs"

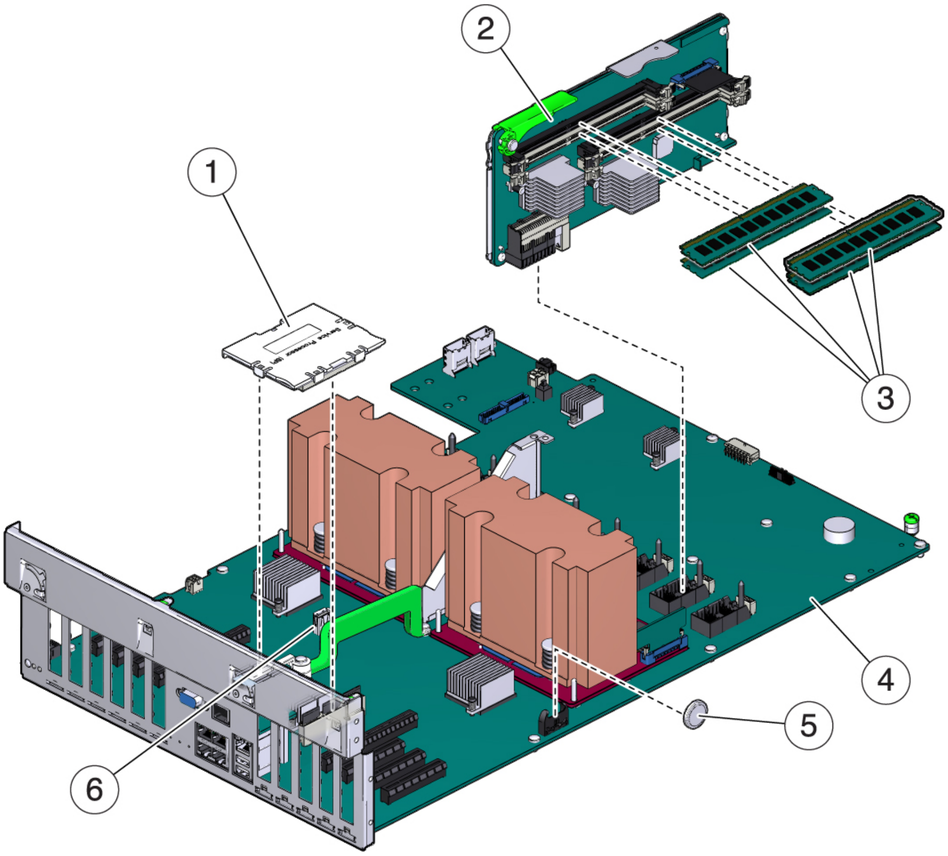
10	Fan board	`/SYS/FANBD`	"Servicing the Fan Board"
11	Fan modules	As viewed from front of server: `/SYS/FANBD/F0` (left front) `/SYS/FANBD/F1` (center front) `/SYS/FANBD/F2` (right front) `/SYS/FANBD/F3` (left rear) `/SYS/FANBD/F4` (center rear) `/SYS/FANBD/F5` (right rear)	"Servicing Fan Modules"
12	DVD drive	`/SYS/SASBP/DVD`	"Servicing the DVD Drive"

13	Drives	`/SYS/SASBP/HDD0` (bottom)
		`/SYS/SASBP/HDD1`
		`/SYS/SASBP/HDD2`
		`/SYS/SASBP/HDD3`
		`/SYS/SASBP/HDD4`
		`/SYS/SASBP/HDD5` (top)
			"Servicing Drives"

Related Information

- “Motherboard Component Locations” on page 19
- “I/O Component Locations” on page 20
- “Power Distribution and Fan Module Component Locations” on page 22
- “System Schematic” on page 23

Motherboard Component Locations



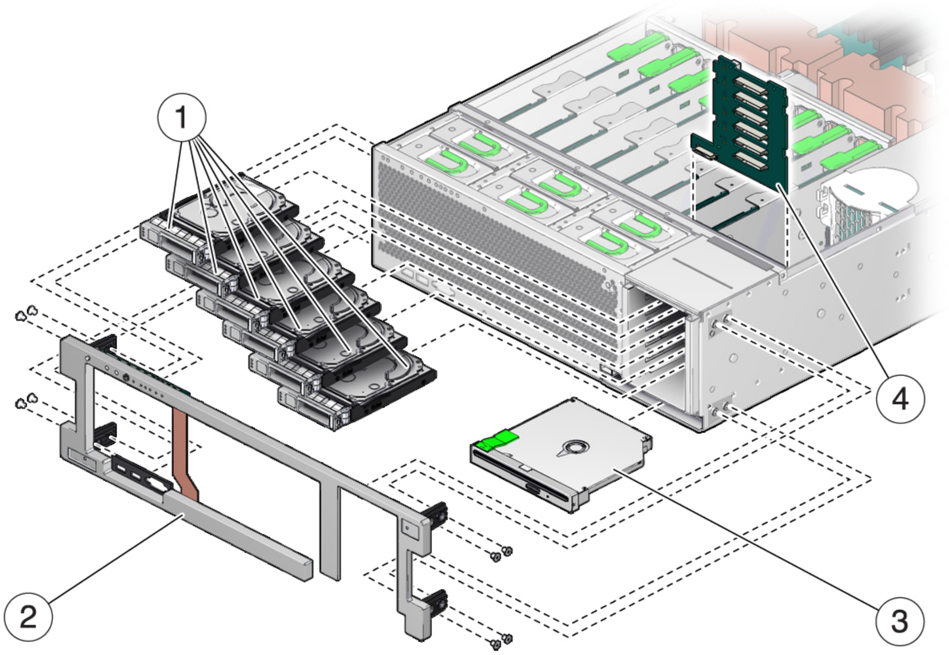
No.	Component	Oracle ILOM Target	LInks
1	SP	`/SYS/MB/SP`	“Servicing the SP”
2	Memory riser	`/SYS/MB/CM`*n*`/CMP/MR`*n*	“Servicing Memory Risers and DIMMs”

No.	Component	Oracle ILOM Target	LInks
3	DIMMs	`/SYS/MB/CMn/CMP/MRn/BOBn/CHn/D0`	"Servicing Memory Risers and DIMMs"
4	Motherboard	`/SYS/MB`	"Servicing the Motherboard"
5	Battery	`/SYS/MB/BAT`	"Servicing the Battery"

Related Information

- "Component Service Categories" on page 53
- "Servicing Memory Risers and DIMMs"
- "Servicing the Motherboard"
- "Servicing the Battery"

I/O Component Locations



No.	Component	Oracle ILOM Target	LInks
1	Drives	`/SYS/SASBP/HDD0` (bottom)	"Servicing Drives"

No.	Component	Oracle ILOM Target	LInks

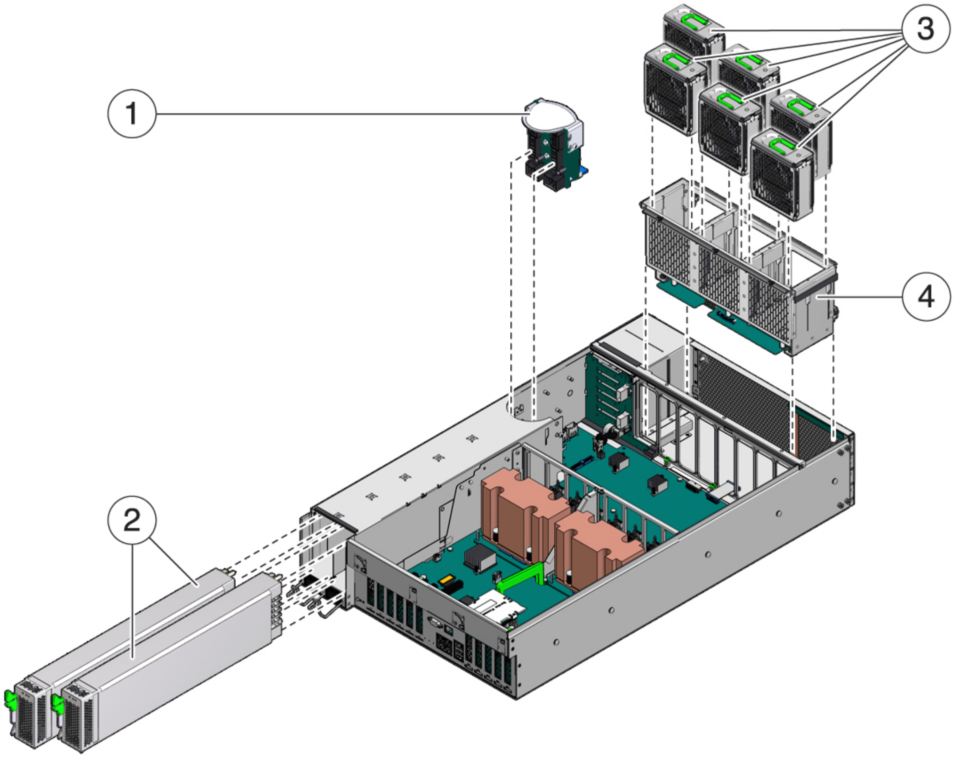
		`/SYS/SASBP/HDD1`
		`/SYS/SASBP/HDD2`
		`/SYS/SASBP/HDD3`
		`/SYS/SASBP/HDD4`
		`/SYS/SASBP/HDD5` (top)	

2	Front control panel light pipe assembly	N/A	"Servicing the Drive Backplane"
3	DVD drive	`/SYS/SASBP/DVD`	"Servicing the DVD Drive"
4	Drive backplane	`/SYS/SASBP`	"Servicing the Drive Backplane"

Related Information

- "Component Service Categories" on page 53
- "Servicing Drives"
- "Servicing the DVD Drive"
- "Servicing the Drive Backplane"

Power Distribution and Fan Module Component Locations



No.	Component	Oracle ILOM Target	Links
1	PS backplane and cover	`/SYS/PDB`	"Servicing the PS Backplane"
2	Power supplies	`/SYS/PS0` (outer) `/SYS/PS1` (inner)	"Servicing Power Supplies"

3	Fan modules	`/SYS/FANBD/F0`
		`/SYS/FANBD/F1`
		`/SYS/FANBD/F2`
		`/SYS/FANBD/F3`
		`/SYS/FANBD/F4`
		`/SYS/FANBD/F5`
			"Servicing Fan Modules"

4	Fan board	`/SYS/FANBD`	"Servicing the Fan Board"

Related Information

- “Component Service Categories” on page 53
- “Servicing Power Supplies”
- “Servicing the PS Backplane”
- “Servicing Fan Modules”
- “Servicing the Fan Board”

System Schematic

These schematic diagrams show the connections between and among components and device slots on the 2-processor server and the 1-processor server. Use these schematic diagrams to determine the optimum locations for optional cards or other peripherals, based on your system's configuration and intended use.

Note - For more detail on root-complexes related to the PCIe slots, see “I/O Root Complex Connections” on page 114.

FIGURE 1 Schematic Diagram for a 2-Processor Server

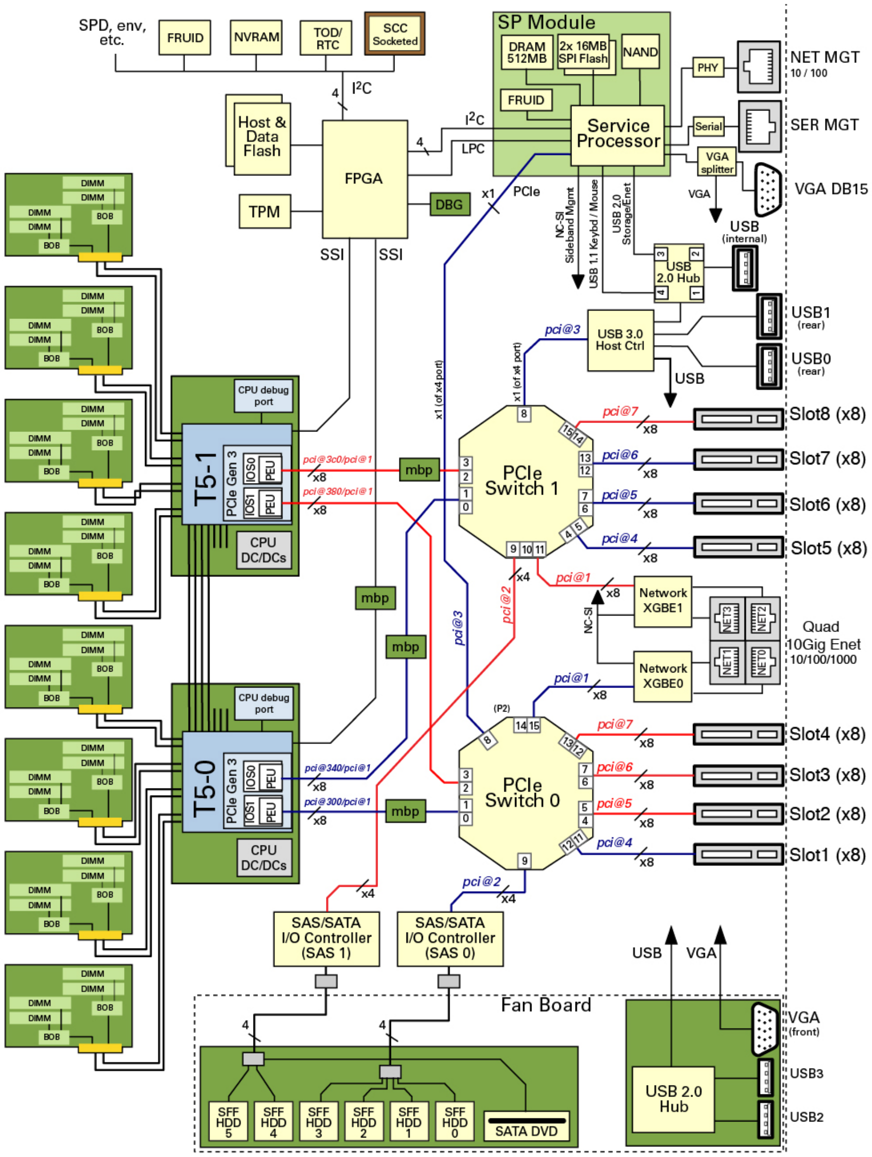
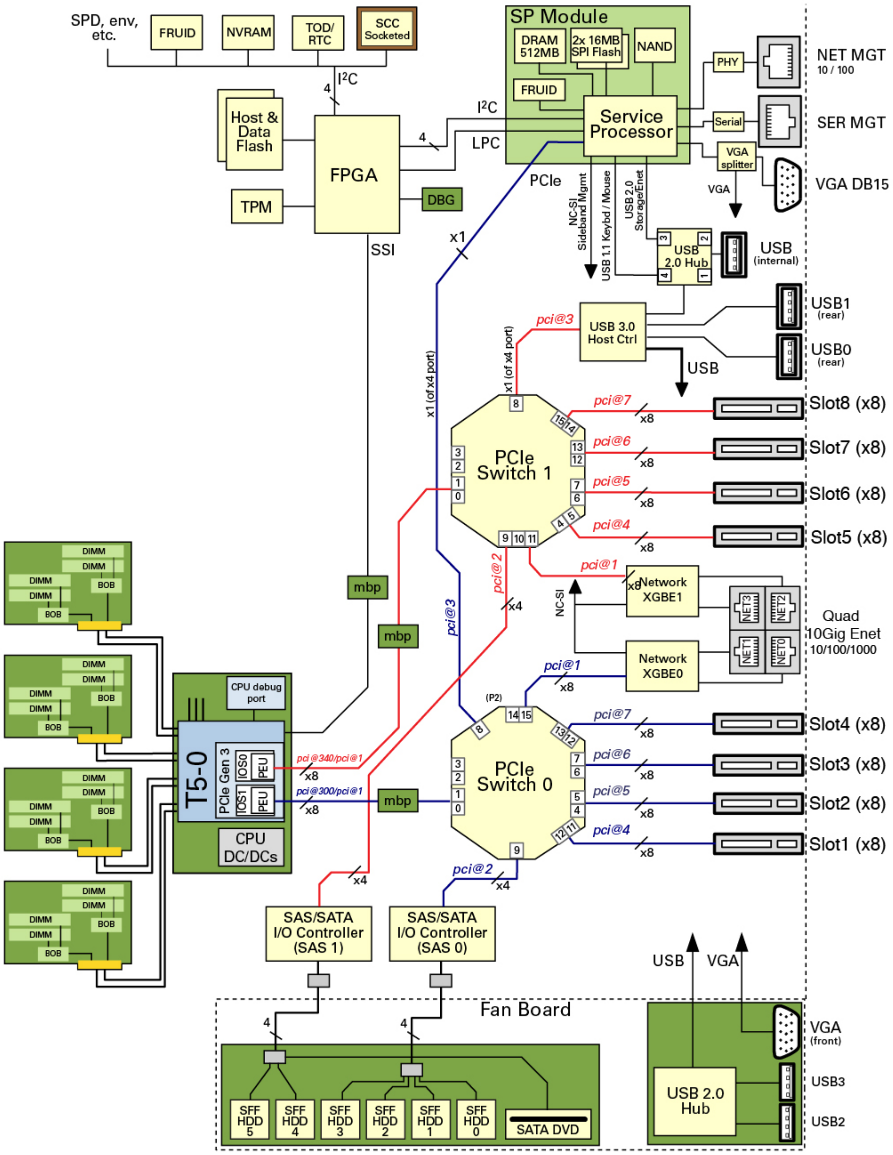

SPD, env, etc.
FRUID
NVRAM
TOD/ RTC
SCC Socketed
I^2C
4
Host & Data Flash
FPGA
TPM
DBG
SSI
SSI
SP Module
DRAM 512MB
2x 16MB SPI Flash
NAND
FRUID
Service Processor
I^2C
LPC
x1
PCIe
PHY
Serial
VGA splitter
VGA
NET MGT
10 / 100
SER MGT
VGA DB15
USB (internal)
NC-SI Sideband Mgmt
USB 1.1 Keybd / Mouse
USB 2.0 Storage/Enet
USB 2.0 Hub
USB1 (rear)
USB0 (rear)
USB 3.0 Host Ctrl
USB
pci@3
x1 (of x4 port)
x1 (of x4 port)
DIMM
BOB
CPU debug port
T5-1
PCIe Gen 3
IOS0
IOS1
PEU
CPU DC/DCs
pci@3c0/pci@1
pci@380/pci@1
x8
mbp
PCIe Switch 1
pci@7
pci@6
pci@5
pci@4
pci@1
x4
x8
Slot8 (x8)
Slot7 (x8)
Slot6 (x8)
Slot5 (x8)
Network XGBE1
Network XGBE0
NC-SI
NET3
NET2
NET1
NET0
Quad 10Gig Enet
10/100/1000
pci@2
pci@3
(P2)
T5-0
pci@340/pci@1
pci@300/pci@1
PCIe Switch 0
Slot4 (x8)
Slot3 (x8)
Slot2 (x8)
Slot1 (x8)
SAS/SATA I/O Controller (SAS 1)
SAS/SATA I/O Controller (SAS 0)
USB
VGA
Fan Board
SFF HDD 5
SFF HDD 4
SFF HDD 3
SFF HDD 2
SFF HDD 1
SFF HDD 0
SATA DVD
USB 2.0 Hub
VGA (front)
USB3
USB2

FIGURE 2 Schematic Diagram for a 1-Processor Server


SPD, env, etc.
FRUID
NVRAM
TOD/ RTC
SCC Socketed
I2C
4
Host & Data Flash
FPGA
TPM
DBG
SSI
SP Module
DRAM 512MB
2x 16MB SPI Flash
NAND
FRUID
I2C
4
LPC
Service Processor
PCIe
PHY
NET MGT 10 / 100
Serial
SER MGT
VGA splitter
VGA
VGA DB15
NC-SI Sideband Mgmt
USB 1.1 Keybd / Mouse
USB 2.0 Storage/Enet
USB 2.0 Hub
USB (internal)
x1
x1 (of x4 port)
pci@3
USB 3.0 Host Ctrl
USB1 (rear)
USB0 (rear)
USB
x1 (of x4 port)
PCIe Switch 1
pci@7
x8
Slot8 (x8)
pci@6
x8
Slot7 (x8)
pci@5
x8
Slot6 (x8)
pci@4
x8
Slot5 (x8)
pci@1
x8
Network XGBE1
NC-SI
NET3
NET2
NET1
NET0
Quad 10Gig Enet 10/100/1000
pci@2
x4
pci@3
pci@1
x8
Network XGBE0
mbp
mbp
DIMM
BOB
CPU debug port
T5-0
PCIe Gen 3
IOS0
PEU
IOS1
PEU
pci@340/pci@1
x8
pci@300/pci@1
x8
mbp
CPU DC/DCs
(P2)
PCIe Switch 0
pci@7
x8
Slot4 (x8)
pci@6
x8
Slot3 (x8)
pci@5
x8
Slot2 (x8)
pci@4
x8
Slot1 (x8)
x4
pci@2
x4
SAS/SATA I/O Controller (SAS 1)
SAS/SATA I/O Controller (SAS 0)
USB
VGA
Fan Board
4
4
SFF HDD 5
SFF HDD 4
SFF HDD 3
SFF HDD 2
SFF HDD 1
SFF HDD 0
SATA DVD
USB 2.0 Hub
VGA (front)
USB3
USB2

Related Information

- “Component Service Categories” on page 53

- "Internal Component Locations" on page 16
- "Motherboard Component Locations" on page 19
- "I/O Component Locations" on page 20
- "Power Distribution and Fan Module Component Locations" on page 22

Component Task Reference

This table lists the names of serviceable components. This table also lists the Oracle ILOM target and the task location for each component. Components not present on the 1-processor server are marked with an asterisk (*).

Component	Oracle ILOM Target	Links
Battery	`/SYS/MB/BAT`	"Servicing the Battery"
DIMMs	`/SYS/MB/CMn/CMP/MRn/BOBn/CHn/D0`	"Servicing Memory Risers and DIMMs"
Drive backplane	`/SYS/SASBP`	"Servicing the Drive Backplane"

Drives	`/SYS/SASBP/HDD0` (bottom)
	`/SYS/SASBP/HDD1`
	`/SYS/SASBP/HDD2`
	`/SYS/SASBP/HDD3`
	`/SYS/SASBP/HDD4`
	`/SYS/SASBP/HDD5` (top)
		"Servicing Drives"

DVD drive	`/SYS/SASBP/DVD`	"Servicing the DVD Drive"
Fan board	`/SYS/FANBD`	"Servicing the Fan Board"
Fan modules	As viewed from front of server: `/SYS/FANBD/F0` (left front) `/SYS/FANBD/F1` (center front) `/SYS/FANBD/F2` (right front) `/SYS/FANBD/F3` (left rear) `/SYS/FANBD/F4` (center rear) `/SYS/FANBD/F5` (right rear)	"Servicing Fan Modules"
Front control panel light pipe assembly	N/A	"Servicing the Drive Backplane"
Memory risers	`/SYS/MB/CM0/CMP/MR0` `/SYS/MB/CM0/CMP/MR1`	"Servicing Memory Risers and DIMMs"

Component	Oracle ILOM Target	Links
	`/SYS/MB/CM0/CMP/MR2`	
	`/SYS/MB/CM0/CMP/MR3`	
	`/SYS/MB/CM1/CMP/MR0*`	
	`/SYS/MB/CM1/CMP/MR1*`	
	`/SYS/MB/CM1/CMP/MR2*`	
	`/SYS/MB/CM1/CMP/MR3*`	
Motherboard	`/SYS/MB`	“Servicing the Motherboard”
PCIe card (in slot 1)	`/SYS/MB/PCIE1`	“Servicing PCIe Cards”
	`/SYS/MB/PCIE2`	
	`/SYS/MB/PCIE3`	
	`/SYS/MB/PCIE4`	
	`/SYS/MB/PCIE5`	
	`/SYS/MB/PCIE6`	
	`/SYS/MB/PCIE7`	
	`/SYS/MB/PCIE8`	
Power supplies	`/SYS/PS0` (outer)	“Servicing Power Supplies”
	`/SYS/PS1` (inner)	
PS backplane and cover	`/SYS/PDB`	“Servicing the PS Backplane”
SP	`/SYS/MB/SP`	“Servicing the SP”

Related Information

- “Component Service Categories” on page 53
- “Internal Component Locations” on page 16
- “Motherboard Component Locations” on page 19
- “I/O Component Locations” on page 20
- “Power Distribution and Fan Module Component Locations” on page 22

Detecting and Managing Faults

These topics explain how to use various diagnostic tools to monitor server status and troubleshoot faults in the server. The examples use the PSH `fmadm faulty` command.

- "Understanding Diagnostics" on page 29
- "Interpreting LEDs" on page 33
- "Configuring POST" on page 37
- "Managing Faults" on page 42
- "Interpreting Log Files and System Messages" on page 46

Related Information

- "Identifying Components"
- "Preparing for Service"
- "Component Service Categories" on page 53
- "Returning the Server to Operation"

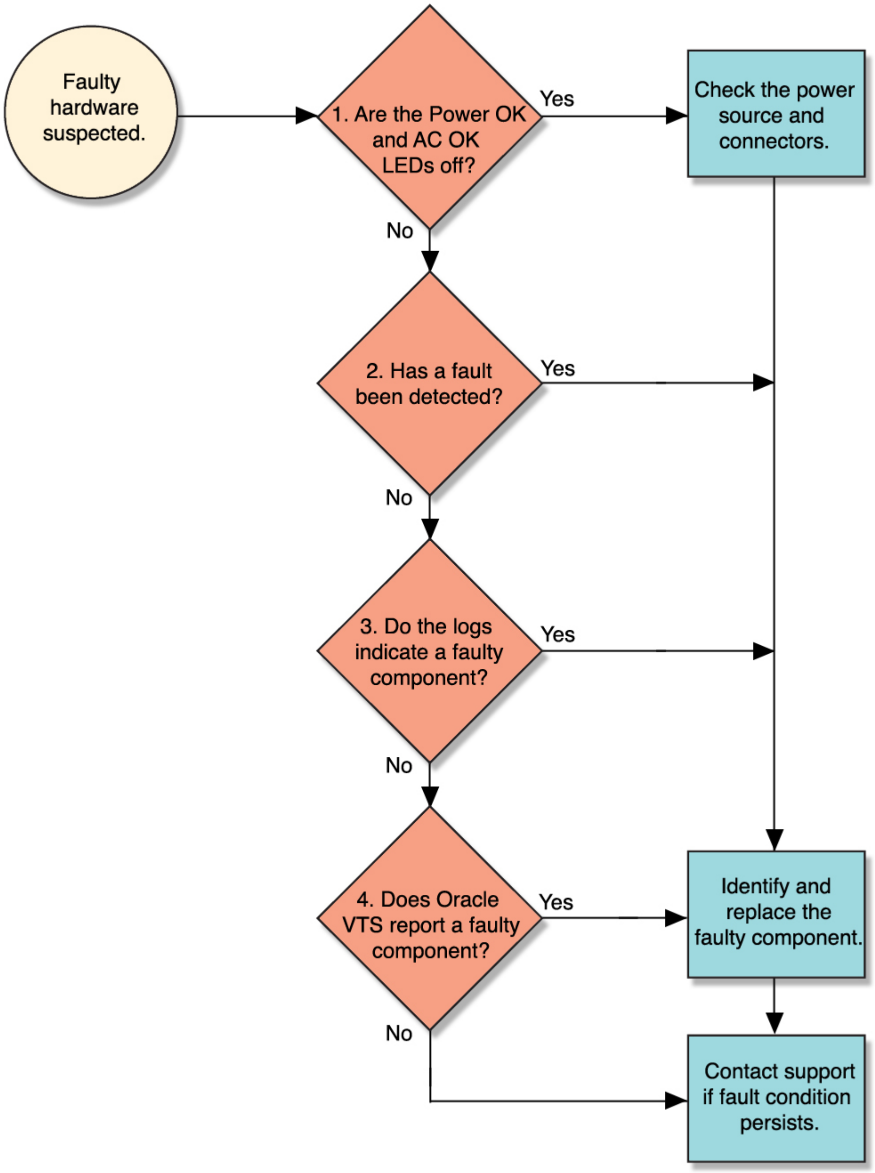
Understanding Diagnostics

These topics explain the diagnostic process and tools.

- "Diagnostics Process" on page 29
- "Tool Availability" on page 31
- "Log In to Oracle ILOM (Service)" on page 32
- "Oracle ILOM Service-Related Tools" on page 32

Diagnostics Process

Depending on the fault, you might need to perform all of the steps or just some of them. You also might have to run diagnostic software that needs to be installed or enabled.


Faulty hardware suspected.
1. Are the Power OK and AC OK LEDs off?
Yes
Check the power source and connectors.
No
2. Has a fault been detected?
Yes
No
3. Do the logs indicate a faulty component?
Yes
No
4. Does Oracle VTS report a faulty component?
Yes
Identify and replace the faulty component.
No
Contact support if fault condition persists.

Note - The diagnostic tools you use, and the order in which you use them, depend on the nature of the problem you are troubleshooting. However, for descriptive purposes, this table follows the steps given in the illustration.

Step	Diagnostic Action	Possible Outcome	Links
1.	Confirm that the Power OK and AC OK LEDs are lit.	If these LEDs are not lit, check the power source and power connections to the server.	“Interpreting LEDs” on page 33
2.	Check the server for detected faults.	Use these tools to check for faults: ■ System LEDs on the front and rear panels. ■ `fmadm faulty` from the Oracle Solaris prompt or through the Oracle ILOM fault management shell. ■ `show faulty` from the Oracle ILOM. prompt or through the Open Problems BUI ■ Datacenter management tools, such as Oracle Enterprise Manager Ops Center.	“Check for Faults” on page 43
3.	Check the log files for fault information.	If system messages indicate a faulty component, replace it.	“Interpreting Log Files and System Messages” on page 46
4.	Run Oracle VTS software.	To run Oracle VTS, the server must be running the Oracle Solaris OS. ■ If Oracle VTS reports a faulty component, replace it. ■ If Oracle VTS does not report a faulty component, run POST.	■ Refer to the Oracle VTS software documentation. ■ “Configuring POST” on page 37 ■ Contact technical support if the problem persists.

Related Information

- “Tool Availability” on page 31
- “Log In to Oracle ILOM (Service)” on page 32
- “Oracle ILOM Service-Related Tools” on page 32

Tool Availability

This table describes what tools are available at the different states in which the server operates.

Tool	Standby Power	OpenBoot Prompt	Oracle Solaris Prompt
Status LEDs	Yes	Yes	Yes
PSH commands	Yes	No	Yes
Oracle ILOM logs and commands	Yes	No	No
OpenBoot commands	No	Yes	No
Oracle Solaris logs and commands	No	No	Yes
Oracle VTS	No	No	Yes (if installed)
Third-party software	No	No	Yes (if installed)

Related Information

- "Diagnostics Process" on page 29
- "Log In to Oracle ILOM (Service)" on page 32
- "Oracle ILOM Service-Related Tools" on page 32

▼ Log In to Oracle ILOM (Service)

- **At the terminal prompt, type:**

```
ssh root@IP-address
Password: password
Waiting for daemons to initialize...
Daemons ready
Oracle (R) Integrated Lights Out Manager
Version 3.1.x
Copyright (c) 2013, Oracle and/or its affiliates, Inc. All rights reserved.
->
```

Related Information

- "Diagnostics Process" on page 29
- "Tool Availability" on page 31
- "Oracle ILOM Service-Related Tools" on page 32

Oracle ILOM Service-Related Tools

You can use these Oracle ILOM CLI commands when performing service-related tasks.

Oracle ILOM Command	Description
`help` [*command*]	Displays a list of all available Oracle ILOM commands with syntax and descriptions. Specifying a command name as an option displays help for that command.
`set /HOST send_break_action=break`	Takes the host server from the OS to either `kmdb` or OpenBoot prompt (equivalent to a Stop-A), depending on the mode in which the Oracle Solaris OS was booted.
`start /HOST/console`	Connects to the host.
`show /HOST/console/history`	Displays the contents of the host's console buffer.
`set /HOST/bootmode` *property*=*value*	Controls the method of booting for the host server's firmware. The value of *property* can be `state`, `config`, or `script`.

Oracle ILOM Command	Description
`stop /System` or `stop /SYS`	Powers off the host server.
`start /System` or `start /SYS`	Powers on the host server.
`reset /System` or `reset /SYS`	Generates a hardware reset on the host server.
`reset /SP`	Reboots the SP.

Related Information

- “Diagnostics Process” on page 29
- “Tool Availability” on page 31
- “Log In to Oracle ILOM (Service)” on page 32

Interpreting LEDs

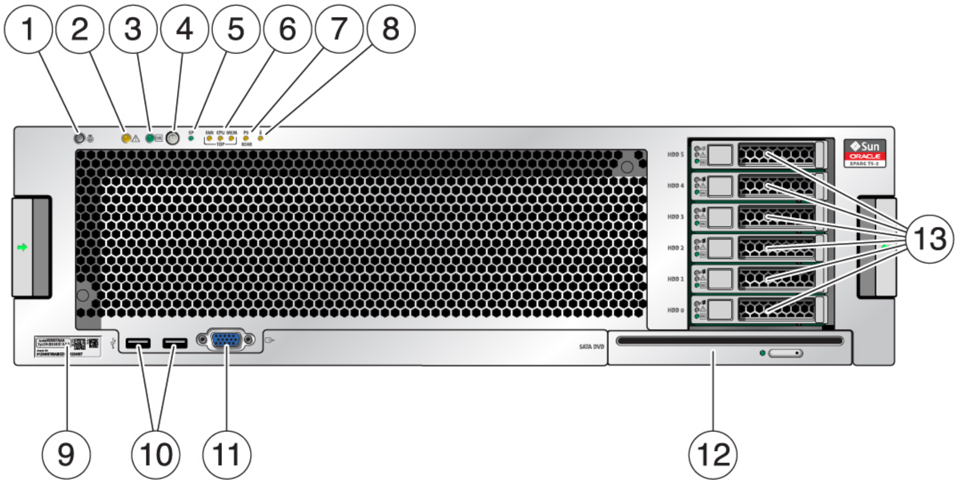
Use these steps to determine if an LED indicates that a component has failed in the server.

Steps	Description	Links
1.	Check the LEDs on the front and rear of the server.	■ “Front Panel Controls and LEDs” on page 34 ■ “Rear Panel Controls and LEDs” on page 36
2.	Check the LEDs on the individual components. **Note -** Component LEDs might not be lit even though the component is faulty. Use the instructions in these links to determine if the component has been diagnosed as being faulty.	■ “Servicing Drives” ■ “Servicing Fan Modules” ■ “Servicing Power Supplies” ■ “Servicing Memory Risers and DIMMs” ■ “Servicing PCIe Cards” ■ “Servicing the Motherboard”

Related Information

- “Understanding Diagnostics” on page 29
- “Managing Faults” on page 42

Front Panel Controls and LEDs



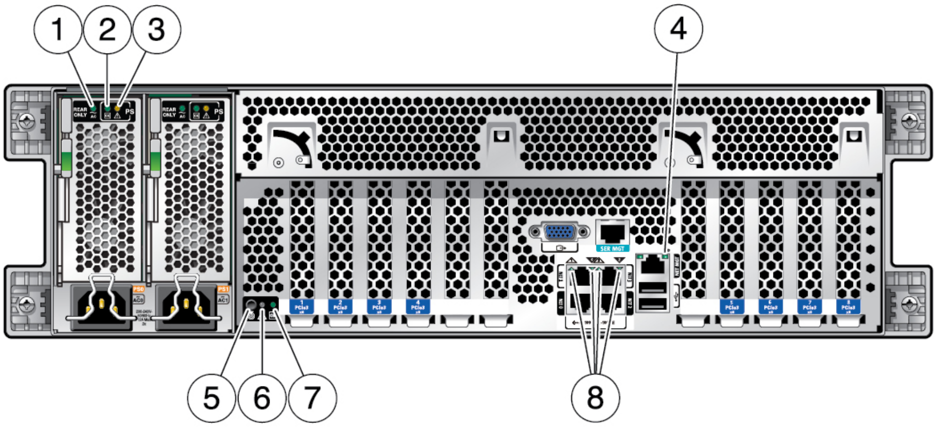
No.	LED	Icon or Label	Description
1	Locator LED and button (white)	◎	You can turn on the Locator LED to identify a particular server. When lit, the LED blinks rapidly. Turn on the Locator LED by pressing the Locator button, or see "Locate the Server" on page 52.
2	Service Required LED (amber)	⚠	The `fmadm faulty` command provides details about any faults that cause this indicator to light. See "Check for Faults" on page 43. Under some fault conditions, individual component fault LEDs are lit in addition to the Service Required LED.
3	Power OK LED (green)	OK	Indicates these conditions: ■ **Off** – Server is not running in its normal state. Server power might be off. The SP might be running. ■ **Steady on** – Server is powered on and is running in its normal operating state. No service actions are required. ■ **Fast blink** – Server is running in standby mode and can be quickly returned to full function. ■ **Slow blink** – A normal but transitory activity is taking place. Slow blinking might indicate that server diagnostics are running or that the server is booting.
4	Power button	⏻	The recessed Power button toggles the server on or off. See "Power Off the Server (Power Button - Graceful)" on page 56.
5	SP LED	SP	Indicates these conditions: ■ **Off** – AC power might have been connected to the power supplies.

No.	LED	Icon or Label	Description
			■ **Steady on, green** – SP is running in its normal operating state. No service actions are required. ■ **Blink, green** – SP is initializing the Oracle ILOM firmware. ■ **Steady on, amber** – An SP error has occurred and service is required.
6	Fan Module Fault LED (amber)	FAN	Indicates these conditions: ■ **Off** – Steady state, no service action is required. ■ **Steady on** – A fan module failure event has been acknowledged and a service action is required on at least one of the fan modules.
6	CPU Fault LED (amber)	CPU	Indicates these conditions: ■ **Off** – Steady state, no service action is required. ■ **Steady on** – A fault has been detected on one or more host processors.
6	Memory Fault LED (amber)	MEM	Indicates these conditions: ■ **Off** – Steady state, no service action is required. ■ **Steady on** – A fault has been detected on one or more DIMMs.
7	Power Supply Fault LED (amber)	PS	Indicates these conditions: ■ **Off** – Steady state, no service action is required. ■ **Steady on** – A fault has been detected on one of the two power supplies
8	System Overtemp LED(amber)	🌡	Indicates these conditions: ■ **Off** – Steady state, no service action is required. ■ **Steady on** – A temperature failure event has been acknowledged. A temperature limit has been exceeded and a service action is required.

Related Information

- “Rear Panel Controls and LEDs” on page 36
- “Understanding Diagnostics” on page 29

Rear Panel Controls and LEDs



No.	LED	Icon or Label	Description
1	Power Supply AC OK LED	AC	Indicates these conditions: ■ **Off** – No AC power applied to this power supply. ■ **Green steady on** – AC power is applied to this power supply and is within specifications. ■ **Amber steady on** – AC power is applied to this power supply and is below 85V.
2	Power Supply DC OK LED (green)	OK	Indicates these conditions: ■ **Off** – 12V DC output from this power supply is disabled or not within spec. ■ **Steady on** – 12V DC output from this power supply is present and within specifications.
3	Power Supply Fault LED (amber)	⚠	Indicates these conditions: ■ **Off** – Steady state, no service action is required. ■ **Steady on** – A fault has been detected on this power supply
4	NET MGT Port Link/ Activity LED (green on left)	LINK/ACT	Indicates these conditions: ■ **Off** – No link is established. ■ **Steady On** – A link is established. ■ **Blinking** – A link is established and there is activity on the port.
4	NET MGT Port Speed LED (green on right)	SPD	Indicates these conditions: ■ **Off** – The link is operating as a 10-Mbps connection. ■ **Steady On** – The link is operating as a 100-Mbps connection.

No.	LED	Icon or Label	Description
5	Locator LED and button (white)	◎	Turn on the Locator LED by pressing the Locator button, or see "Locate the Server" on page 52. When lit, the LED blinks rapidly.
6	Service Required LED (amber)	⚠	The `fmadm faulty` command provides details about any faults that cause this indicator to light. See "Check for Faults" on page 43. Under some fault conditions, individual component fault LEDs are lit in addition to the Service Required LED.
7	Power OK LED (green)	OK	Indicates these conditions: ■ **Off** – Server is not running in its normal state. System power might be off. The SP might be running. ■ **Steady on** – Server is powered on and is running in its normal operating state. No service actions are required. ■ **Fast blink** – Server is running in standby mode and can be quickly returned to full function. ■ **Slow blink** – A normal but transitory activity is taking place. Slow blinking might indicate that system diagnostics are running or that the system is booting.
8	Host Ethernet Port Link/ Activity LED (green) These LEDs, from left to right, represent NET 1, NET 0, NET 3, and NET 2.		Indicates these conditions: ■ **Off** – No link is established. ■ **Steady On** – A link is established. ■ **Blinking** – A link is established and there is activity on the port.

Related Information

- "Front Panel Controls and LEDs" on page 34
- "Understanding Diagnostics" on page 29

Configuring POST

These topics explain how to configure POST as a diagnostic tool.

- "POST Overview" on page 38
- "Oracle ILOM Properties That Affect POST Behavior" on page 38
- "Configure POST" on page 40
- "Run POST With Maximum Testing" on page 42

POST Overview

POST is a group of PROM-based tests that run when the server is powered on or when it is reset. POST checks the basic integrity of the critical hardware components in the server.

You can also set other Oracle ILOM properties to control various other aspects of POST operations. For example, you can specify the events that cause POST to run, the level of testing POST performs, and the amount of diagnostic information POST displays. These properties are described in "Oracle ILOM Properties That Affect POST Behavior" on page 38.

If POST detects a faulty component, the component is disabled automatically. If the server is able to run without the disabled component, the server boots when POST completes its tests. For example, if POST detects a faulty processor core, the core is disabled, POST completes its test sequence, and the server boots using the remaining cores.

Related Information

- "Oracle ILOM Properties That Affect POST Behavior" on page 38
- "Configure POST" on page 40
- "Run POST With Maximum Testing" on page 42

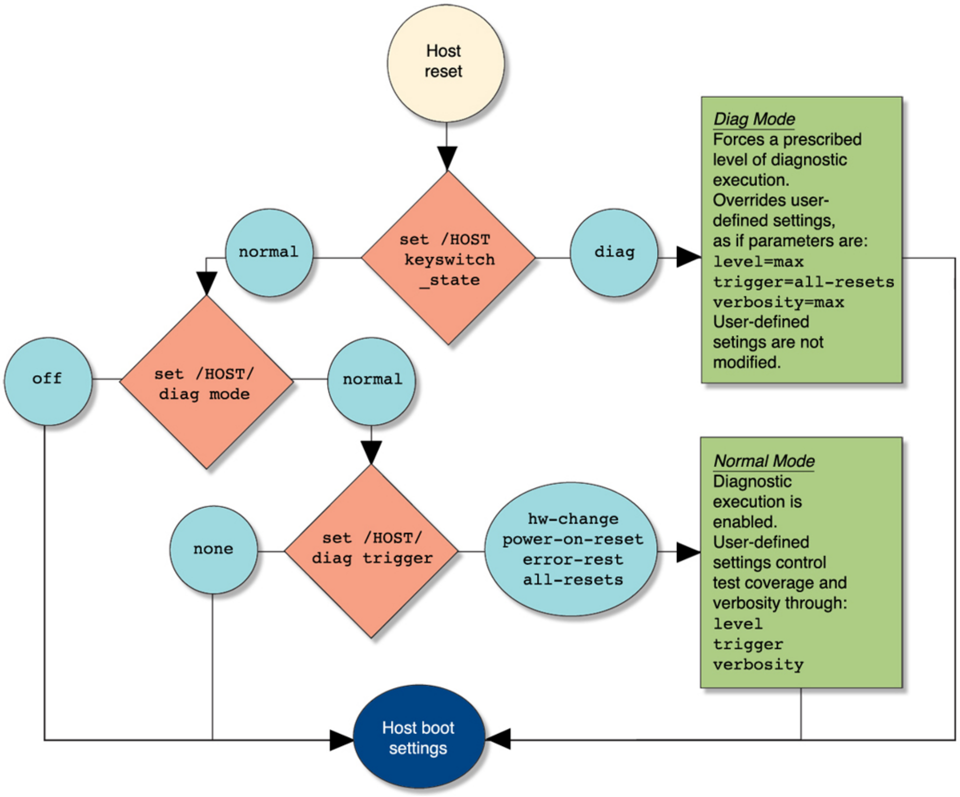
Oracle ILOM Properties That Affect POST Behavior

Note - The value of `keyswitch_state` must be `normal` when individual POST parameters are changed.

Parameter	Values	Description
`/HOST keyswitch_state`	`normal`	The server can power on and run POST (based on the other parameter settings). This parameter overrides all other commands.
	`diag`	The server runs POST based on predetermined settings.
	`standby`	The server cannot power on.
	`locked`	The server can power on and run POST, but no flash updates can be made.
`/HOST/diag mode`	`off`	POST does not run.
	`normal`	POST runs according to `diag level` value.
`/HOST/diag level`	`max`	If `diag mode=normal`, runs all the minimum tests plus extensive processor and memory tests.

Parameter	**Values**	**Description**
	`min`	If `diag mode=normal`, runs minimum set of tests.
`/HOST/diag trigger`	`none`	Does not run POST on reset.
	`hw-change`	(Default) Runs POST following a FRU replacement or an AC power cycle.
	`hw_change_level`	■ `max` (default) – Runs the maximum set of tests. ■ `min` – Runs the minimum set of tests.
	`hw_change_verbosity`	■ `min` (default) – Displays the minimum level of output. ■ `max` – Displays information for each step. ■ normal – Displays a moderate amount of information, including component names and test results. ■ `debug` – Displays extensive debugging information. ■ `none` – Disables the output.
	`power-on-reset`	Runs POST on every power on.
	`power_on_level`	■ `max` (default) – Runs the maximum set of tests. ■ `min` – Runs the minimum set of tests.
	`power_on_verbosity`	■ `min` (default) – Displays the minimum level of output. ■ `max` – Displays information for each step. ■ normal – Displays a moderate amount of information, including component names and test results. ■ `debug` – Displays extensive debugging information. ■ `none` – Disables the output.
	`error-reset`	(Default) Runs POST if fatal errors are detected.
	`error_reset_level`	■ `max` (default) – Runs the maximum set of tests. ■ `min` – Runs a minimum set of tests.
	`error_reset_verbosity`	■ `min` (default) – Displays the minimum level of output. ■ `max` – Displays information for each step. ■ `normal` – Displays a moderate amount of information, including component names and test results. ■ `debug` – Displays extensive debugging information. ■ `none` – Disables the output.
	`all-resets`	Runs POST after any reset.
`/HOST/diag verbosity`	`normal`	Displays all test and informational messages in POST output.
	`min`	Displays functional tests with a banner and pinwheel in POST output.
	`max`	Displays all test, informational, and some debugging messages in POST output.
	`debug`	Displays extensive debugging information.
	`none`	Does not display POST output.

This flowchart illustrates the same set of Oracle ILOM `set` command variables.


Host reset
set /HOST keyswitch _state
normal
diag
Diag Mode
Forces a prescribed level of diagnostic execution.
Overrides user-defined settings, as if parameters are:
level=max
trigger=all-resets
verbosity=max
User-defined setings are not modified.
off
set /HOST/ diag mode
normal
none
set /HOST/ diag trigger
hw-change
power-on-reset
error-rest
all-resets
Normal Mode
Diagnostic execution is enabled.
User-defined settings control test coverage and verbosity through:
level
trigger
verbosity
Host boot settings

Related Information

- "POST Overview" on page 38
- "Configure POST" on page 40
- "Run POST With Maximum Testing" on page 42

▼ Configure POST

1. **Log in to Oracle ILOM.**

   See "Log In to Oracle ILOM (Service)" on page 32.

2. **Set the virtual keyswitch to the value that corresponds to the POST configuration you want to run.**

   This example sets the virtual keyswitch to `normal`, which configures POST to run according to other parameter values.

```
-> set /HOST keyswitch_state=normal
Set keyswitch_state to Normal
```

For possible values for the `keyswitch_state` parameter, see "Oracle ILOM Properties That Affect POST Behavior" on page 38.

3. **If the virtual keyswitch is set to `normal`, and you want to define the `mode`, `level`, `trigger`, or `verbosity`, set the respective parameters.**

   Syntax:

   `set /HOST/diag` *property*=*value*

   See "Oracle ILOM Properties That Affect POST Behavior" on page 38 for a list of parameters and values.

   Examples:

```
-> set /HOST/diag mode=normal
-> set /HOST/diag verbosity=max
```

4. **View the current values for settings.**

   Example:

```
-> show /HOST/diag

/HOST/diag
   Targets:

   Properties:
        error_reset_level = max
        error_reset_verbosity = normal
        hw_change_level = max
        hw_change_verbosity = normal
        level = min
        mode = normal
        power_on_level = max
        power_on_verbosity = normal
        trigger = hw_change error-reset
        verbosity = normal

   Commands:
        cd
        set
        show
->
```

Related Information

- “POST Overview” on page 38
- “Oracle ILOM Properties That Affect POST Behavior” on page 38
- “Run POST With Maximum Testing” on page 42

▼ Run POST With Maximum Testing

This procedure describes how to configure the server to run the maximum level of POST.

1. **Log in to Oracle ILOM.**

   See “Log In to Oracle ILOM (Service)” on page 32.

2. **Set the virtual keyswitch to `diag` so that POST runs in service mode.**

```
-> set /HOST keyswitch_state=diag
Set keyswitch_state to Diag
```

3. **Reset the server so that POST runs.**

   There are several ways to initiate a reset. This example shows a reset using the `reset` command.

```
-> reset /SYS
Are you sure you want to reset /SYS (y/n)? y
Resetting /SYS
```

Related Information

- “POST Overview” on page 38
- “Oracle ILOM Properties That Affect POST Behavior” on page 38
- “Configure POST” on page 40

Managing Faults

These topics describe the PSH feature.

- “PSH Overview” on page 43
- “Check for Faults” on page 43
- “Clear a Fault” on page 45

PSH Overview

PSH provides problem diagnosis on the SP and the host. Regardless of where a fault occurs, you can view and manage the fault diagnosis from the SP or the host.

When possible, PSH initiates steps to take the component offline. PSH also logs the fault to the `syslogd` daemon and provides a fault notification with a message ID. You can use the message ID to get additional information about the problem from the knowledge article database.

A PSH console message provides this information about each detected fault:

- Type
- Severity
- Description
- Automated response
- Impact
- Suggested action for system administrator

If PSH detects a faulty component, use the `fmadm faulty` command to display information about the fault. See "Check for Faults" on page 43.

Related Information

- "Check for Faults" on page 43
- "Clear a Fault" on page 45

Check for Faults

The `fmadm faulty` command displays the list of faults detected by PSH. You can run this command from either the host or through the Oracle ILOM fault management shell.

1. **Log in to Oracle ILOM.**
   See "Log In to Oracle ILOM (Service)" on page 32.

2. **Check for PSH-diagnosed faults.**
   This example shows how to check for faults through the Oracle ILOM fault management shell.

```
-> start /SP/faultmgmt/shell
Are you sure you want to start /SP/faultmgmt/shell (y/n)? y

faultmgmtsp> fmadm faulty
------------------- ------------------------------------ -------------- -------
```

```
Time                UUID                                 msgid          Severity
------------------- ------------------------------------ ------------- -------
2012-08-27/19:46:26 4ec16c8d-5cdb-c6ca-c949-e24d3637ef27 PCIEX-8000-8R Major

Problem Status   : solved
Diag Engine      : [unknown]
System
  Manufacturer   : Oracle Corporation
  Name           : SPARC T5-8
  Part_Number    : 12345678+11+1
  Serial_Number  : 1238BDC0DF

----------------------------------------
Suspect 1 of 1
  Fault class  : fault.io.pciex.device-interr-corr
  Certainty    : 100%
  Affects      : hc:///chassis=0/motherboard=0/cpuboard=0/chip=0/hostbridge=0/
                pciexrc=0
 Status       : faulted but still in service
  FRU
     Status      : faulty
     Location    : /SYS/PM0
     Manufacturer      : Oracle Corporation
     Name              : TLA,PN,NRM,T5 1.2
     Part_Number       : 7061001
     Revision          : 01
     Serial_Number     : 465769T+12445102WR
     Chassis
        Manufacturer   : Oracle Corporation
        Name           : SPARC T5-8
        Part_Number    : 12345678+13+2
        Serial_Number  : 1248DC140

Description : A fault has been diagnosed by the Host Operation System.

Response    : The service required LED on the chassis and on the affected
              FRU may be illuminated.

Impact      : No SP impact

Action      : Refer to the associated reference document at
              http://support.oracle.com/msg/PCIEX-8000-8R for the latest
              service procedures and policies regarding this diagnosis.
faultmgmtsp>
```

In this example, a fault is displayed that includes these details:

- **Date and time of the fault (`2012-08-27/19:46:26`).**
- **UUID (`4e16c8d-5cdb-c6ca-c949-e24d3637ef27`), which is unique to each fault.**

- **Message identifier (`PCIEX-8000-8R`), which can be used to obtain additional fault information from Knowledge Base articles.**

3. **Use the message ID to obtain more information about this type of fault.**

   a. **Obtain the message ID from console output.**

   b. **Go to `https://support.oracle.com`, and search on the message ID in the Knowledge tab.**

4. **Follow the suggested actions to repair the fault.**

5. **If necessary, clear the fault manually.**
   See "Clear a Fault" on page 45.

Related Information

- "PSH Overview" on page 43
- "Clear a Fault" on page 45

Clear a Fault

When PSH detects faults, the faults are logged and displayed on the console. In most cases, after the fault is repaired, the corrected state is detected by the server, and the fault condition is repaired automatically. However, this repair should be verified. In cases where the fault condition is not automatically cleared, you must clear the fault manually.

1. **After replacing a faulty FRU, power on the server.**

2. **At the host prompt, determine whether the replaced FRU still shows a faulty state.**
   See "Check for Faults" on page 43.

   - **If no fault is reported, you do not need to do anything else. Do not perform the subsequent steps.**

   - **If a fault is reported, continue to Step 3.**

3. **Clear the fault from all persistent fault records.**
   In some cases, even though the fault is cleared, some persistent fault information remains and results in erroneous fault messages at boot time. To ensure that these messages are not displayed, type this PSH command:

```
# fmadm acquit event-ID
```

4. **If required, reset the server.**

   In some cases, the output of the `fmadm faulty` command might include this message for the faulty component:

   ```
   faulted and taken out of service
   ```

   If this message appears in the output, you must reset the server after you manually repair the fault.

   ```
   -> reset /SYS
   Are you sure you want to reset /SYS? y
   Resetting /SYS ...
   ```

Related Information

- "PSH Overview" on page 43
- "Check for Faults" on page 43

Interpreting Log Files and System Messages

With the OS running on the server, you have the full complement of Oracle Solaris OS files and commands available for collecting information and for troubleshooting.

If PSH does not indicate the source of a fault, check the message buffer and log files for notifications for faults. Drive faults are usually captured by the Oracle Solaris message files.

These topics explain how to view the log files and system messages.

- "Check the Message Buffer" on page 46
- "Understanding Diagnostics" on page 29
- "Managing Faults" on page 42

▼ Check the Message Buffer

The `dmesg` command checks the system buffer for recent diagnostic messages and displays them.

1. **Log in as superuser.**

2. **Type:**

```
# dmesg
```

Related Information

- "View Log Files (Oracle Solaris)" on page 47
- "View Log Files (Oracle ILOM)" on page 47

▼ View Log Files (Oracle Solaris)

The error logging daemon, `syslogd`, automatically records various system warnings, errors, and faults in message files. These messages can alert you to system problems such as a device that is about to fail.

The `/var/adm` directory contains several message files. The most recent messages are in the `/var/adm/messages` file. After a period of time (usually every week), a new `messages` file is automatically created. The original contents of the `messages` file are rotated to a file named `messages.1`. Over a period of time, the messages are further rotated to `messages.2` and `messages.3`, and then deleted.

1. **Log in as superuser.**
2. **Type:**

```
# more /var/adm/messages
```

3. **To view all logged messages, type:**

```
# more /var/adm/messages*
```

Related Information

- "Check the Message Buffer" on page 46
- "View Log Files (Oracle Solaris)" on page 47

▼ View Log Files (Oracle ILOM)

1. **View the event log.**

```
-> show /SP/logs/event/list
```

2. **View the audit log.**

```
-> show /SP/logs/audit/list
```

Related Information

- "Check the Message Buffer" on page 46
- "View Log Files (Oracle Solaris)" on page 47

Preparing for Service

These topics explain how to prepare the server for servicing.

Step	Description	Links
1.	Review safety and handling information.	“Safety Information” on page 49
2.	Gather the tools needed for service.	“Tools Needed For Service” on page 51
3.	Consider filler panel options.	“Filler Panels” on page 51
4.	Review component service categories.	“Component Service Categories” on page 53
5.	Find the server serial number.	“Find the Server Serial Number” on page 52
6.	Identify the server to be serviced.	“Locate the Server” on page 52
7.	For cold-service operations, shut down the OS and remove power from the server.	“Removing Power From the Server” on page 54
8.	Move the server out of the rack and gain access to internal components.	“Accessing Server Components” on page 57
9.	Attach devices to the server to perform service procedures.	“Attachment of Devices During Service” on page 63

Related Information

- “Identifying Components”
- “Returning the Server to Operation”

Safety Information

For your protection, observe the following safety precautions when setting up your equipment:

- Follow all cautions and instructions marked on the equipment and described in the documentation shipped with your server.
- Follow all cautions and instructions marked on the equipment and described in the *SPARC T5-2 Safety and Compliance Guide*.
- Ensure that the voltage and frequency of your power source match the voltage and frequency inscribed on the equipment's electrical rating label.

- Follow the ESD safety practices as described in this section.

Safety Symbols

Note the meanings of the following symbols that might appear in this document:

Caution - There is a risk of personal injury or equipment damage. To avoid personal injury and equipment damage, follow the instructions.

Caution - Hot surface. Avoid contact. Surfaces are hot and might cause personal injury if touched.

Caution - Hazardous voltages are present. To reduce the risk of electric shock and danger to personal health, follow the instructions.

ESD Measures

ESD sensitive devices, such as the cards, drives, and DIMMS, require special handling.

Caution - Circuit boards and drives contain electronic components that are extremely sensitive to static electricity. Ordinary amounts of static electricity from clothing or the work environment can destroy the components located on these boards. Do not touch the components along their connector edges.

Caution - You must disconnect all power supplies before servicing any of the components that are inside the chassis.

Antistatic Wrist Strap Use

Wear an antistatic wrist strap and use an antistatic mat when handling components such as drive assemblies, circuit boards, or PCI cards. When servicing or removing server components, attach an antistatic strap to your wrist and then to a metal area on the chassis. Following this practice equalizes the electrical potentials between you and the server.

Note - An antistatic wrist strap is no longer included in the accessory kit for this server. However, antistatic wrist straps are still included with options.

Antistatic Mat

Place ESD-sensitive components such as motherboards, memory, and other PCBs on an antistatic mat.

Related Information

- “Prevent ESD Damage” on page 58
- “Tools Needed For Service” on page 51

Tools Needed For Service

You need the following tools for most service operations:

- Antistatic wrist strap
- Antistatic mat
- No. 2 Phillips screwdriver
- No. 1 flat-blade screwdriver (battery removal)
- Pen or pencil (to power on server)

Related Information

- “Safety Information” on page 49

Filler Panels

A filler panel is an empty metal or plastic enclosure that is installed at the factory or in the field into a server component slot that does not contain a functioning component. The filler panels ensure proper airflow through the system. Depending on the component configuration, the server can include the following types of filler panels:

- Drive filler
- DVD drive filler
- PCIe card filler covering back panel, not filling the connector slot)

Caution - When you remove a server component while the server is connected to power, insert a new component or filler panel within 60 seconds to ensure proper system chassis cooling. After you complete cold-servicing, ensure that all fillers are in place before connecting the server to power.

Related Information

- “Servicing Drives”
- “Servicing the DVD Drive”
- “Servicing Memory Risers and DIMMs”
- “Servicing PCIe Cards”
- “Returning the Server to Operation”

▼ Find the Server Serial Number

You need the serial number of the server's chassis to obtain technical support for the system.

Note - When a PDB, fan board, or drive backplane is replaced, the chassis serial number and part number might need to be programmed into the new component. This must be done in a special service mode by trained service personnel.

● **Locate the serial number using one of the following methods:**

- **Read the serial number from a sticker located on the front of the server or another sticker on the side of the server.**
- **At the Oracle ILOM prompt type:**

```
-> show /System

/System
   Targets:
. . .
```

In the output look for a line under Properties that identifies the product serial number. For example:

```
        product_serial_number = BDL1026F8F
```

Related Information

- “Front Panel Components (Service)” on page 13

▼ Locate the Server

You can use the Locator LEDs to identify one particular server from many other servers.

1. **At the Oracle ILOM prompt, type:**

   ```
   -> set /System/locator_indicator=on
   ```

   The white Locator LEDs (one on the front panel and one on the rear panel) blink.

2. **After locating the server with the blinking Locator LED, turn it off by pressing the Locator button.**

   Alternatively, you can type an Oracle ILOM command to turn off the Locator LED.

   ```
   -> set /System/locator_indicator=off
   ```

Related Information

- "Front Panel Components (Service)" on page 13

Component Service Categories

The server components and assemblies that can be replaced in the field fall into three categories:

- Hot-service, replaceable by customer
- Cold-service, replaceable by customer
- Cold-service, replaceable by authorized service personnel

Cold service procedures require that you shut the server down and unplug the power cables that connect the power supplies to the power source.

Although hot service procedures can be performed while the server is running, you should usually bring it to standby mode as the first step in the replacement procedure. Refer to "Power Off the Server (Power Button - Graceful)" on page 56 for instructions.

The following table identifies the components in each category.

Component service Category	Component	Service information	Notes
Hot-service, replaceable by customer	Drive	"Servicing Drives"	Drive must be offline.
	Drive filler	"Servicing Drives"	Needed to preserve proper interior air flow.
	Power supply	"Servicing Power Supplies"	If two power supplies are in use. Otherwise, cold service.

Component service Category	Component	Service information	Notes
	Fan module	"Servicing Fan Modules"	Removal of a fan in the rear row requires replacement within 30 seconds to avoid overheating
Cold-service, replaceable by customer	Memory risers and DIMMs	"Servicing Memory Risers and DIMMs"	
	DVD drive/filler	"Servicing the DVD Drive"	Remove any media prior to replacement. A drive or a filer must be installed to preserve proper interior air flow.
	System battery	"Servicing the Battery"	
	I/O cards	"Servicing PCIe Cards"	
Cold-service, replaceable by authorized service personnel	Fan board	"Servicing the Fan Board"	
	Motherboard	"Servicing the Motherboard"	Transfer system configuration PROM to new motherboard.
	Drive backplane	"Servicing the Drive Backplane"	
	PS backplane	"Servicing the PS Backplane"	

Related Information

- "Component Task Reference" on page 26

Removing Power From the Server

Step	Description	Links
1.	Prepare the server for powering off.	"Prepare to Power Off the Server" on page 55
2.	Power off the server by one of three methods.	"Power Off the Server (Oracle ILOM)" on page 55 "Power Off the Server (Power Button - Graceful)" on page 56 "Power Off the Server (Emergency Shutdown)" on page 56
3.	Disconnect the power cords from the server.	"Disconnect Power Cords" on page 57

Related Information

- "Front Panel Components (Service)" on page 13
- *Servers Administration*

▼ Prepare to Power Off the Server

Perform this procedure before powering off the server.

1. **Log in as superuser or equivalent.**

   Depending on the type of problem, you might want to view server status or log files. You also might want to run diagnostics before you shut down the server.

2. **Notify affected users that the server will be shut down.**

   Refer to the Oracle Solaris system administration documentation for additional information.

3. **Save any open files and quit all running programs.**

   Refer to your application documentation for specific information on these processes.

4. **Shut down all logical domains.**

   Refer to Oracle Solaris system administration and Oracle VM Server for SPARC documentation for additional information.

5. **Shut down the Oracle Solaris OS.**

   Refer to the Oracle Solaris system administration documentation for additional information.

Related Information

- "Power Off the Server (Power Button - Graceful)" on page 56
- "Power Off the Server (Emergency Shutdown)" on page 56
- "Front Panel Components (Service)" on page 13

▼ Power Off the Server (Oracle ILOM)

You can use the SP to perform a graceful shutdown of the server, and to ensure that all of your data is saved and the server is ready for restart.

Note - Additional information about powering off the server is provided in *Servers Administration*.

---

1. **Prepare to power off the server.**

   See "Prepare to Power Off the Server" on page 55.

2. **Switch from the system console to the Oracle ILOM prompt by typing the `#.` (Hash-Dot) key sequence.**

3. **Power off the server.**

```
-> stop /System
```

Note - You can also use the Power button on the front of the server to initiate a graceful server shutdown. (See “Power Off the Server (Power Button - Graceful)” on page 56.) This button is recessed to prevent accidental server power-off.

Related Information

- “Prepare to Power Off the Server” on page 55
- “Power Off the Server (Power Button - Graceful)” on page 56
- “Power Off the Server (Emergency Shutdown)” on page 56
- “Front Panel Components (Service)” on page 13

Power Off the Server (Power Button - Graceful)

This procedure places the server in the power standby mode. In this mode, the Power OK LED blinks rapidly.

1. **Prepare to power off the server.**

   See “Prepare to Power Off the Server” on page 55.

2. **Press and release the recessed Power button.**

   You might need to use a pointed object, such as a pen or pencil.

Related Information

- “Prepare to Power Off the Server” on page 55
- “Power Off the Server (Oracle ILOM)” on page 55
- “Power Off the Server (Emergency Shutdown)” on page 56
- “Front Panel Components (Service)” on page 13

Power Off the Server (Emergency Shutdown)

Caution - All applications and files will be closed abruptly without saving changes. File system corruption might occur.

1. **Prepare to power off the server.**
   See “Prepare to Power Off the Server” on page 55.

2. **Press and hold the Power button for five seconds.**

Related Information

- “Prepare to Power Off the Server” on page 55
- “Power Off the Server (Oracle ILOM)” on page 55
- “Power Off the Server (Power Button - Graceful)” on page 56
- “Front Panel Components (Service)” on page 13

▼ Disconnect Power Cords

Before You Begin Remove the power cords from the server only after powering off the server.

● **Unplug all power cords from the server.**

Caution - Because 3.3V standby power is always present in the server, you must unplug the power cords before accessing any cold-serviceable components.

Related Information

- “Power Off the Server (Oracle ILOM)” on page 55
- “Power Off the Server (Power Button - Graceful)” on page 56
- “Power Off the Server (Emergency Shutdown)” on page 56
- “Rear Panel Components (Service)” on page 15

Related Information

- “Safety Information” on page 49

Accessing Server Components

These topics explain how to access components on the outside and the inside of the server. Perform these tasks in this order, as needed.

- “Prevent ESD Damage” on page 58
- “Extend the Server to the Service Position” on page 58
- “Release the CMA” on page 60
- “Remove the Server From the Rack” on page 61

- “Remove the Top Cover” on page 62

Related Information

- “Safety Information” on page 49

▼ Prevent ESD Damage

Many components housed within the chassis can be damaged by ESD. To protect these components from damage, perform the following steps before opening the chassis for service.

1. **Prepare an antistatic surface to set parts on during the removal or installation process.**

   Place ESD-sensitive components such as the printed circuit boards on an antistatic mat. The following items can be used as an antistatic mat:

   - **Antistatic bag used to wrap a replacement part**
   - **ESD mat**
   - **Disposable ESD mat (shipped with some replacement parts or optional components)**

2. **Attach an antistatic wrist strap.**

   When servicing or removing server components, attach an antistatic strap to your wrist and then to a metal area on the chassis.

Related Information

- “Safety Information” on page 49

▼ Extend the Server to the Service Position

You can service the following components with the server in the service position:

- Drives
- DVD module
- Power supplies
- Fan modules
- Fan boards

- Memory risers
- DIMMs
- PCIe cards
- SP card
- Battery

Note - You can replace the drives, DVD module, and power supplies without extending the server into the service position.

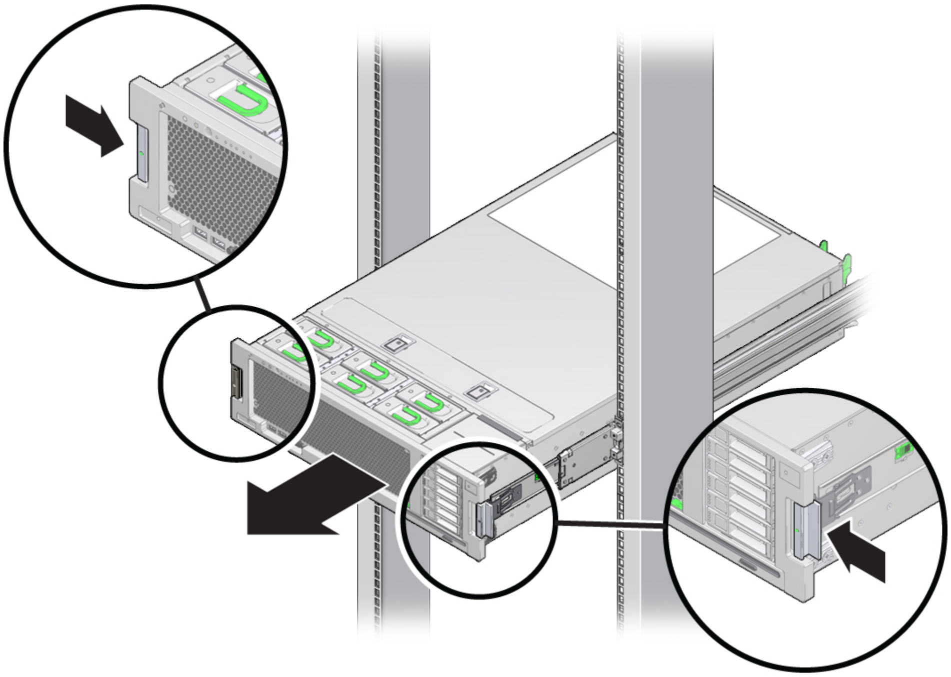
---

1. **Verify that no cables will be damaged or will interfere when the server is extended.**

   Although the CMA that is supplied with the server is hinged to accommodate extending the server, you should ensure that all cables and cords are capable of extending.

2. **From the front of the server, release the two slide release latches.**

   Squeeze the green slide release latches to release the slide rails.



3. **While squeezing the slide release latches, slowly pull the server forward until the slide rails latch.**

Related Information

- “Release the CMA” on page 60
- “Remove the Server From the Rack” on page 61

▼ Release the CMA

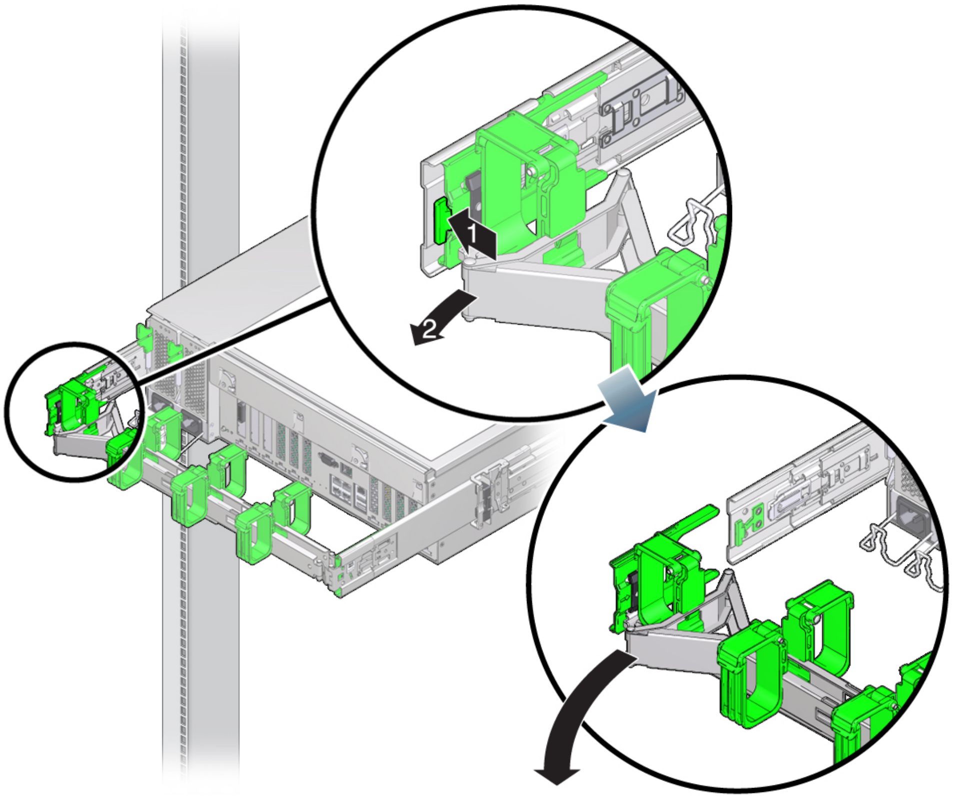
For some service procedures, such as replacing a power supply, if you are using a CMA, you might need to release the CMA to gain access to the rear of the chassis.

Note - For instructions on how to install the CMA for the first time, refer to *Server Installation*.

---

1. **Press and hold the tab.**

   The tab is on the inside rear of the left side of the CMA.



2. **Swing the CMA out of the way.**

   Do not allow the CMA to hang unsupported while it is unattached.

3. **When you have finished the service steps that require the CMA to be out of the way, swing the CMA closed and latch it to the left rack rail.**

   Check that the CMA and the cables are functioning properly after completing service.

Related Information

- "Extend the Server to the Service Position" on page 58
- "Remove the Server From the Rack" on page 61
- "Returning the Server to Operation"

▼ Remove the Server From the Rack

You must remove the server from the rack to remove or install these components:

- Motherboard
- PS backplane
- Drive backplane

Caution - The server chassis is heavy. To avoid personal injury, use two people to remove the server from the rack.

---

1. **Shut down the host.**

2. **Remove power from the server.**

   See "Removing Power From the Server" on page 54.

3. **Disconnect all the cables and power cords from the server.**

4. **Extend the server to the maintenance position.**

   See "Extend the Server to the Service Position" on page 58.

5. **Release the CMA from the rail assembly.**

   The CMA is still attached to the cabinet, but the server chassis is now disconnected from the CMA. See "Release the CMA" on page 60.

6. **From the front of the server, pull the release tabs forward and pull the server forward until it is free of the rack rails.**

   A release tab is located on each rail.

7. **Set the server on a sturdy work surface.**

Related Information

- “Extend the Server to the Service Position” on page 58
- “Release the CMA” on page 60

▼ Remove the Top Cover

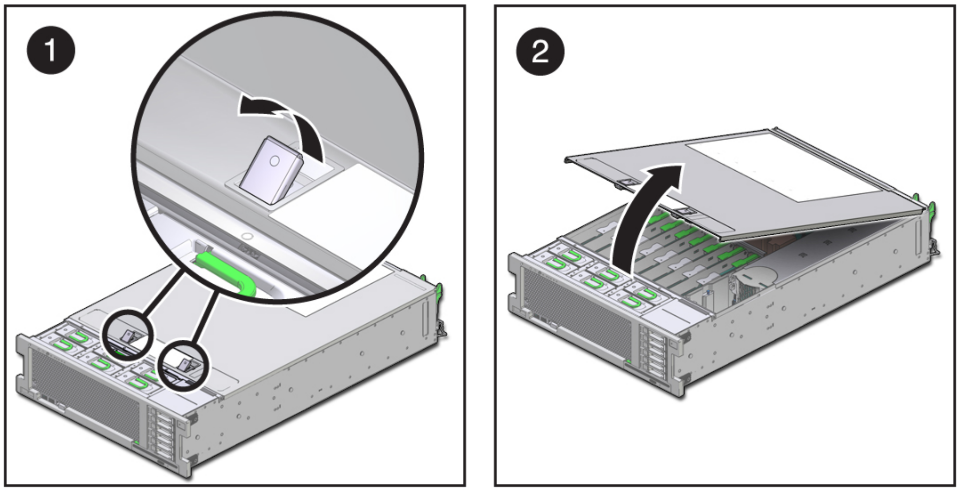
Caution - Removing the top cover without properly powering down the server and disconnecting the AC power cords from the power supplies will result in a chassis intrusion switch failure. This failure causes the server to be immediately powered off. Any changes you make to the memory riser or DIMM configurations will not be properly reflected in the service processor's inventory until you replace the top cover.

---

1. **Ensure that the AC power cords are disconnected from the server power supplies.**

2. **Unlatch the server top cover.**

   Insert your fingers under the two cover latches and simultaneously lift both latches in an upward motion as shown in panel 1.



3. **Lift the cover slightly and slide it toward the front of the server chassis about 0.5 inch (12 mm).**

4. **Lift up and remove the top cover as shown in panel 2.**

   A metal air baffle is attached to the rear inside surface of the top cover. When you remove the top cover, lift it carefully so that the air baffle doe not catch on anything inside the server.

Related Information

- "Replace the Top Cover" on page 159

Attachment of Devices During Service

During service procedures, you might have to connect devices to the server.

- For OS support, connect an Ethernet cable to the one of the Ethernet connectors (NET 0, NET 1, NET 2, and NET 3).
- If you plan to interact with the system console directly, you can connect additional external devices, such as a mouse and keyboard, to the server's USB connectors, and connect a monitor to a HD-15 video connector. The rear HD-15 video connector is active by default. For more details on selecting an active video port, refer to *Server Installation*.
- If you plan to connect to the Oracle ILOM software over the network, connect an Ethernet cable to the Ethernet port labeled NET MGT.

Note - The service processor (SP) uses the NET MGT (out-of-band) port by default. You can configure the SP to share one of the sever's four Ethernet ports instead. The SP uses only the configured Ethernet port.

- If you plan to access the Oracle ILOM CLI through the management port, connect a serial null modem cable to the RJ-45 serial port labeled SER MGT.
- The USB connectors on the front panel support USB 2.0. The USB connectors on the rear panel support USB 3.0.

Related Information

- "Front Panel Components (Service)" on page 13
- "Rear Panel Components (Service)" on page 15
- "Detecting and Managing Faults"
- *Server Installation*

Servicing Drives

The server provides six 2.5-inch drive bays, accessible through the front panel. See "Front Panel Components (Service)" on page 13. Drives can be removed and installed while the server is running. This feature, referred to as being *hot-serviceable*, depends on how the drives are configured.

Note - The server supports traditional, disk-based storage devices and Flash SSDs, which are diskless storage devices based on solid-state memory. Either type of drive can be a boot device. The terms "drive" and "HDD" are used in a generic sense to refer to both types of internal storage devices.

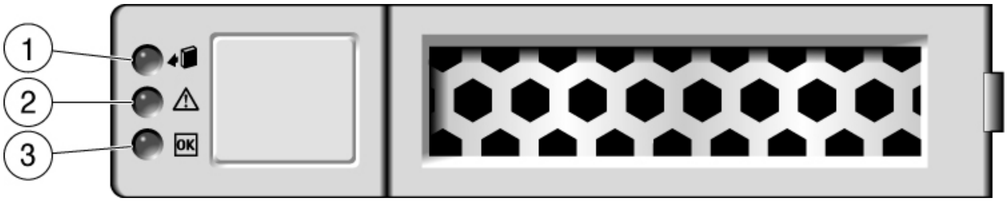
These topics explain how to service drives.

- "Drive LEDs" on page 66
- "Remove a Drive Filler Panel" on page 70
- "Remove a Drive" on page 67
- "Install a Drive" on page 71
- "Install a Drive Filler Panel" on page 73
- "Verify Drive Functionality" on page 74

Related Information

- "Component Service Categories" on page 53
- "Remove a Drive Filler Panel" on page 70
- "Remove a Drive" on page 67
- "Install a Drive" on page 71
- "Install a Drive Filler Panel" on page 73
- "Verify Drive Functionality" on page 74

Drive LEDs



The following table explains how to interpret the drive status LEDs.

	LED		Color	Description
1	Ready to Remove		Blue	Indicates that a drive can be removed during a hot-service operation.
2	Service Required	⚠	Amber	Indicates that the drive has experienced a fault condition.
3	OK/Activity (HDDs)	OK	Green	Indicates the drive's availability for use. ■ **On –** Read or write activity is in progress. ■ **Off –** Drive is idle and available for use.
3	OK/Activity (SSDs)	OK	Green	Indicates the drive's availability for use. ■ **On –** Read or write activity is in progress. ■ **Off –** Drive is idle and available for use. ■ **Flashes on and off –** This situation occurs during hot-service operations. You can ignore this situation.

Note - The front and rear panel Service Action Required LEDs are also lit when the server detects a drive fault. See “Front Panel Components (Service)” on page 13 and “Rear Panel Components (Service)” on page 15.

Related Information

- “Front Panel Components (Service)” on page 13
- “Rear Panel Components (Service)” on page 15
- “Remove a Drive” on page 67
- “Install a Drive” on page 71

- "Remove a Drive Filler Panel" on page 70
- "Install a Drive Filler Panel" on page 73
- "Verify Drive Functionality" on page 74

▼ Locate a Faulty Drive

You must determine which drive is faulty before you replace it.

1. **Check to see if any System Service Required LEDs are lit or flashing.**

   See "Interpreting LEDs" on page 33.

2. **Visually inspect the drive to see if any of its status LEDs are lit or flashing.**

   See "Drive LEDs" on page 66.

   If the drive is faulty, replace it. See "Remove a Drive" on page 67.

3. **If you are unable to identify the faulty drive, seek further information.**

   See "Detecting and Managing Faults".

Related Information

- "Drive LEDs" on page 66
- "Remove a Drive" on page 67
- "Install a Drive" on page 71
- "Verify Drive Functionality" on page 74
- "Detecting and Managing Faults"

▼ Remove a Drive

A customer can perform this procedure while the server is running. See "Component Service Categories" on page 53 for more information about hot-service procedures.

To hot-service a drive, you must first take it offline. This action prevents applications from accessing the drive and removes software links to it.

1. **Determine if you need to shut down the OS to replace the drive, and perform one of the following actions:**

   - **If the drive contains the sole image of the OS or cannot be logically isolated from the server's online operations, shut down the OS as described in "Power Off the Server (Oracle ILOM)" on page 55. Then go to Step 3.**

- **If the drive can be taken offline without shutting down the OS, go to Step 2.**

2. **Take the drive offline.**

   a. **At the Oracle Solaris prompt, list all drives in the device tree, including drives that are not configured.**

```
# cfgadm -al
```

This command lists dynamically reconfigurable hardware resources and shows their operational status. In this case, look for the status of the drive you plan to remove. This information is listed in the `Occupant` column.

```
Ap_id                        Type         Receptacle   Occupant       Condition
c0                           scsi-bus     connected    configured     unknown
c0::dsk/c1t0d0               disk         connected    configured     unknown
c0::dsk/c1t0d0               disk         connected    configured     unknown
usb0/1                       unknown      empty        unconfigured   ok
usb0/2                       unknown      empty        unconfigured   ok
...
```

You must unconfigure any drive whose status is listed as configured, as described in Step 2.b.

   b. **Unconfigure the drive.**

For example, where the drive to be unconfigured is the first drive listed in Step 2.a:

```
# cfgadm -c unconfigure c0::dsk/c1t1d0
```

Replace `c0:dsk/c1t1d0` with the drive name that applies to your situation.

   c. **Verify that the drive's blue Ready-to-Remove LED is lit.**

3. **Determine whether you can replace the drive using the hot-service procedure or whether you need to power off the server using the cold-service procedure.**

The cold-service procedure is required if the drive has one of these characteristics:

- **Contains the operating system, and the operating system is not mirrored on another drive.**
- **Cannot be logically isolated from the online operations of the server.**

4. **Take one of the following actions:**

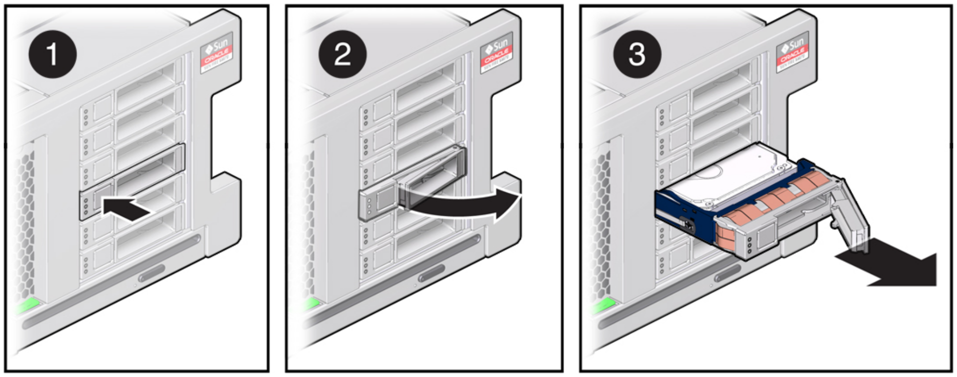
- **To cold-service the drive, power off the server. Complete one of the procedures described in "Removing Power From the Server" on page 54.**

- **To hot-service the drive, take the drive offline using one of the procedures in "Power Off the Server (Power Button - Graceful)" on page 56. This action removes the logical software links to the drive and prevents any applications from accessing it.**

5. **If you are hot-servicing the drive, locate the drive that displays the amber Fault LED and ensure that the blue Ready-to-Remove LED is lit.**

6. **Attach an antistatic wrist strap.**

7. **On the drive you want to remove, complete the following tasks.**



Caution - The latch is not an ejector. Do not bend it too far to the right. Doing so can damage the latch.

   a. **Push the release button to open the latch.**

   b. **Unlock the drive by moving the latch to the right.**

   c. **Grasp the latch and pull the drive out of the slot.**

Caution - When you remove a drive, replace it with a filler panel or another drive. Otherwise, the server might overheat due to improper airflow.

8. **Install a replacement drive or a drive filler panel.**

See “Install a Drive” on page 71 or “Install a Drive Filler Panel” on page 73.

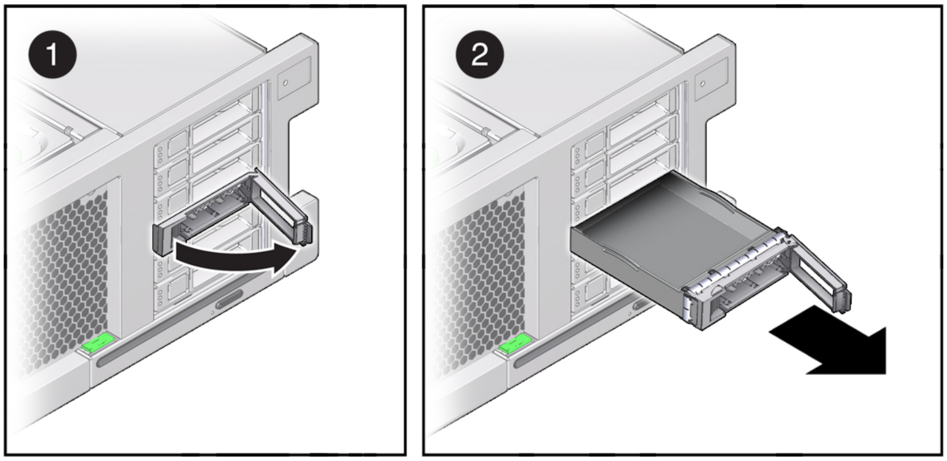
Related Information

- “Install a Drive” on page 71
- “Remove a Drive Filler Panel” on page 70
- “Install a Drive Filler Panel” on page 73
- “Verify Drive Functionality” on page 74

▼ Remove a Drive Filler Panel

A customer can perform this procedure while the server is running. See “Component Service Categories” on page 53 for more information about hot-service procedures.

1. **Attach an antistatic wrist strap.**
2. **On the drive filler panel you want to remove, complete the following tasks.**



Caution - The latch is not an ejector. Do not bend it too far to the right. Doing so can damage the latch.

   a. **Push the release button to open the latch and unlock the drive filler panel by moving the latch to the right.**
   b. **Grasp the latch and pull the filler panel out of the drive slot.**

Caution - When you remove a drive filler panel, replace it with another filler panel or a drive. Otherwise, the server might overheat due to improper airflow.

3. **Install a drive or a replacement drive filler panel.**

   See “Install a Drive Filler Panel” on page 73 or “Install a Drive” on page 71.

Related Information

- “Locate a Faulty Drive” on page 67
- “Remove a Drive” on page 67
- “Install a Drive” on page 71
- “Install a Drive Filler Panel” on page 73
- “Verify Drive Functionality” on page 74

▼ Install a Drive

Installing a drive into a server is a two-step process. You must first install the drive into the drive slot and then configure that drive to the server.

Note - If you removed an existing drive from a slot in the server, you must install the replacement drive in the same slot as the drive that was removed. Drives are physically addressed according to the slot in which they are installed.

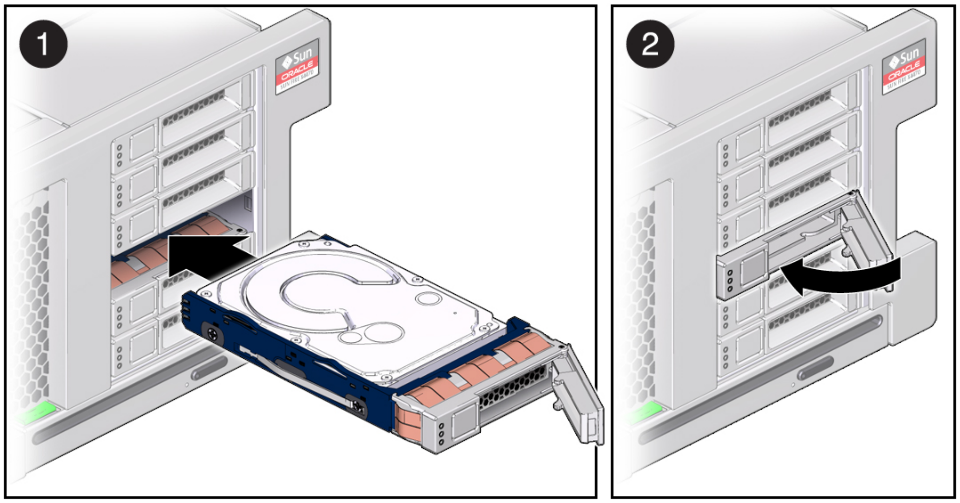
1. **Remove a drive or a drive filler panel.**

   See “Remove a Drive” on page 67 or “Remove a Drive Filler Panel” on page 70.

2. **Unpack the drive and place it on an antistatic mat.**

3. **Fully open the release lever on the drive.**

4. **Install the drive by completing the following tasks.**



a. **Slide the drive into the drive slot until it is fully seated.**

b. **Close the latch to lock the drive in place.**

5. **Return the drive to operation by doing one of the following:**

   - **If you cold-serviced the drive, restore power to the server. Complete the procedure described in "Power On the Server (Oracle ILOM)" on page 162 or "Power On the Server (Power Button)" on page 162.**

   - **If you hot-serviced the drive, configure it using the `cfgadm -c configure` command. The following example shows the drive at `c0::dsk/c1t1d0` being configured.**

```
# cfgadm -c configure c0::dsk/c1t1d0
```

Replace `c0:dsk/c1t1d0` with the drive name that applies to your situation.

6. **Verify the drive functionality.**

   See "Verify Drive Functionality" on page 74.

Related Information

- "Locate a Faulty Drive" on page 67
- "Remove a Drive" on page 67

- “Remove a Drive Filler Panel” on page 70
- “Install a Drive Filler Panel” on page 73
- “Verify Drive Functionality” on page 74

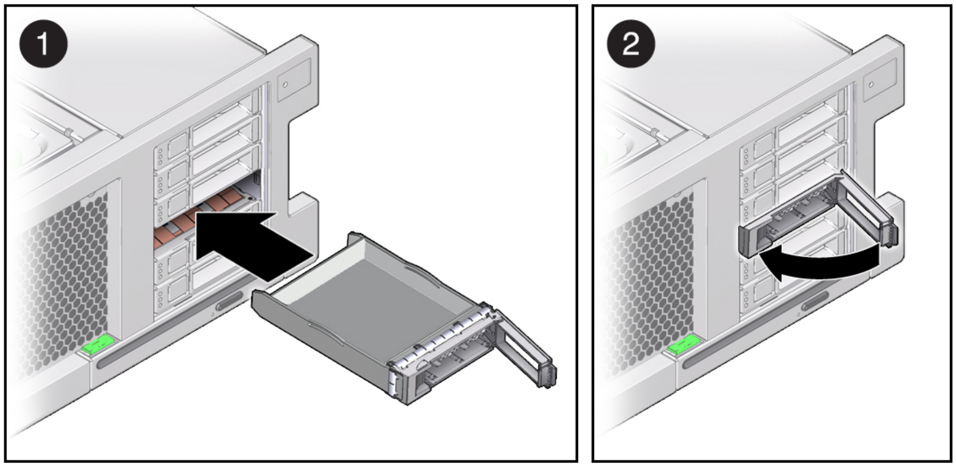
▼ Install a Drive Filler Panel

1. **Remove a drive or a drive filler panel.**

   See “Remove a Drive” on page 67 or “Remove a Drive Filler Panel” on page 70.

2. **Fully open the release lever on the drive filler panel.**

3. **Install the drive by completing the following tasks.**



   a. **Slide the drive filler panel into the drive slot until it is fully seated.**

   b. **Close the latch to lock the filler panel in place.**

Related Information

- “Locate a Faulty Drive” on page 67
- “Remove a Drive” on page 67
- “Install a Drive” on page 71
- “Remove a Drive Filler Panel” on page 70
- “Verify Drive Functionality” on page 74

▼ Verify Drive Functionality

1. **If the OS is shut down, and the drive you replaced was not the boot device, boot the OS.**

   Depending on the nature of the replaced drive, you might need to perform administrative tasks to reinstall software before the server can boot. Refer to the Oracle Solaris OS administration documentation for more information.

2. **At the Oracle Solaris prompt, list all drives in the device tree, including any drives that are not configured.**

   ```
   # cfgadm -al
   ```

   This command helps you identify the drive you installed.

   ```
   Ap_id              Type        Receptacle   Occupant       Condition
   c0                 scsi-bus    connected    configured     unknown
   c0::dsk/c1t0d0     disk        connected    configured     unknown
   c0::sd1            disk        connected    unconfigured   unknown
   usb0/1             unknown     empty        unconfigured   ok
   usb0/2             unknown     empty        unconfigured   ok
   ...
   ```

3. **Configure the drive.**

   For example, to configure the second disk listed in Step 2, type:

   ```
   # cfgadm -c configure c0::sd1
   ```

   Replace `c0::sd1` with the drive name for your configuration.

4. **Verify that the blue Ready to Remove LED is no longer lit on the drive that you installed.**

   See “Locate a Faulty Drive” on page 67.

5. **At the Oracle Solaris prompt, list all drives in the device tree, including any drives that are not configured:**

   ```
   # cfgadm -al
   ```

   The replacement drive is now listed as configured, as shown in the following example.

   ```
   Ap_Id             Type        Receptacle   Occupant     Condition
   c0                scsi-bus    connected    configured   unknown
   c0::dsk/c1t0d0    disk        connected    configured   unknown
   ```

```
c0::dsk/c1t1d0   disk        connected    configured    unknown
usb0/1           unknown     empty        unconfigured  ok
usb0/2           unknown     empty        unconfigured  ok
...
```

6. **Perform one of the following tasks based on your verification results:**

   - **If the previous steps did not verify the drive, see “Diagnostics Process” on page 29.**

   - **If the previous steps indicate that the drive is functioning properly, perform the tasks required to configure the drive. These tasks are covered in the Oracle Solaris OS administration documentation.**

   For additional drive verification, you can run Oracle VTS. Refer to the Oracle VTS documentation for details. See **Broken Link (Target ID: Z40000117163)**.

Related Information

- “Locate a Faulty Drive” on page 67
- “Remove a Drive” on page 67
- “Install a Drive” on page 71

Servicing Fan Modules

The six fan modules in the server are located at the front of the chassis. See "Identifying Components". You can access them without removing the server cover. You might need to extend the server from the rack to access the fan modules. Each fan module contains a single fan that is mounted in an integrated, hot-serviceable component.

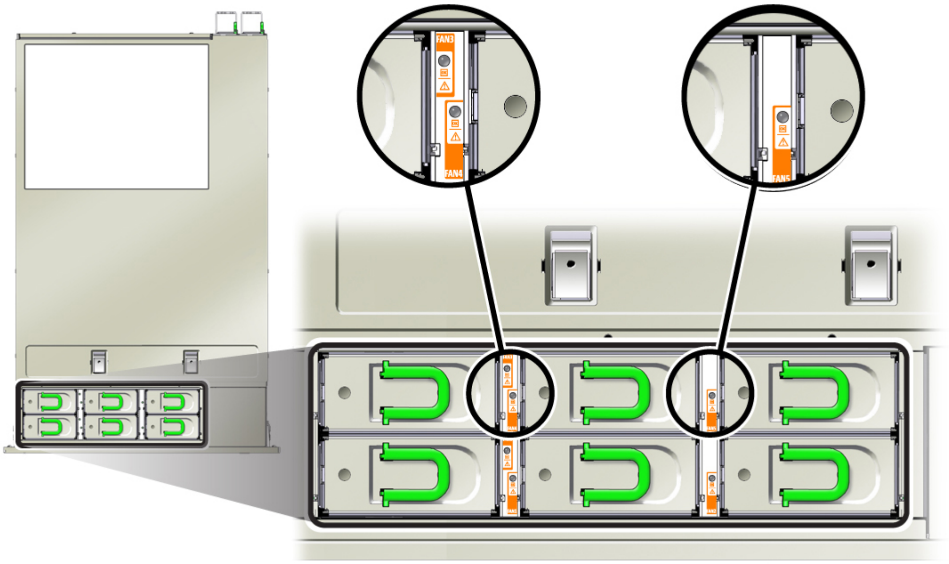
These topics explain how to service faulty fan modules.

- "Fan Module LEDs" on page 78
- "Locate a Faulty Fan Module" on page 78
- "Remove a Fan Module" on page 79
- "Install a Fan Module" on page 81
- "Verify Fan Module Functionality" on page 82

Related Information

- "Preparing for Service"
- "Servicing the Fan Board"

Fan Module LEDs



LED		Color	Status When Lit
Power OK	OK	Green	The server is powered on and the fan module is functioning correctly.
Service Required	⚠	Amber	The fan module is faulty.

Related Information

- “Locate a Faulty Fan Module” on page 78
- “Detecting and Managing Faults”

▼ Locate a Faulty Fan Module

- **View the following LEDs, which are lit when a fan module fault is detected.**

- Fan Module (FAN) Fault LED on the front of the server. See "Front Panel Components (Service)" on page 13.
- Fan Fault LED on or adjacent to the faulty fan module. See "Fan Module LEDs" on page 78. Each fan module contains an LED. When the amber Service Required LED is lit, a fault has occurred on that fan module.

Note - The front and rear panel Service Action Required LEDs are also lit when the server detects a fan module fault. The server Overtemp LED might also light if a fan fault causes an increase in server operating temperature.

Related Information

- "Front Panel Components (Service)" on page 13
- "Rear Panel Components (Service)" on page 15
- "Extend the Server to the Service Position" on page 58
- "Remove a Fan Module" on page 79
- "Detecting and Managing Faults"

▼ Remove a Fan Module

Caution - While the fan modules provide some cooling redundancy, if a fan module fails, replace it as soon as possible to maintain server availability. When you remove one of the fans in the rear row (fans 3, 4, or 5), you must replace it within 30 seconds to prevent overheating of the server.

Caution - The fan module contains hazardous moving parts. Unless the power to the server is completely shut down, replacing the fan modules is the only service permitted in the fan compartment.

A customer can perform this procedure while the server is running. See "Component Service Categories" on page 53 for more information about hot-service procedures.

1. **Prepare for servicing.**
   a. **Attach an antistatic wrist strap.**
   See "Prevent ESD Damage" on page 58.

   b. **Extend the server to the maintenance position.**
   See "Extend the Server to the Service Position" on page 58.

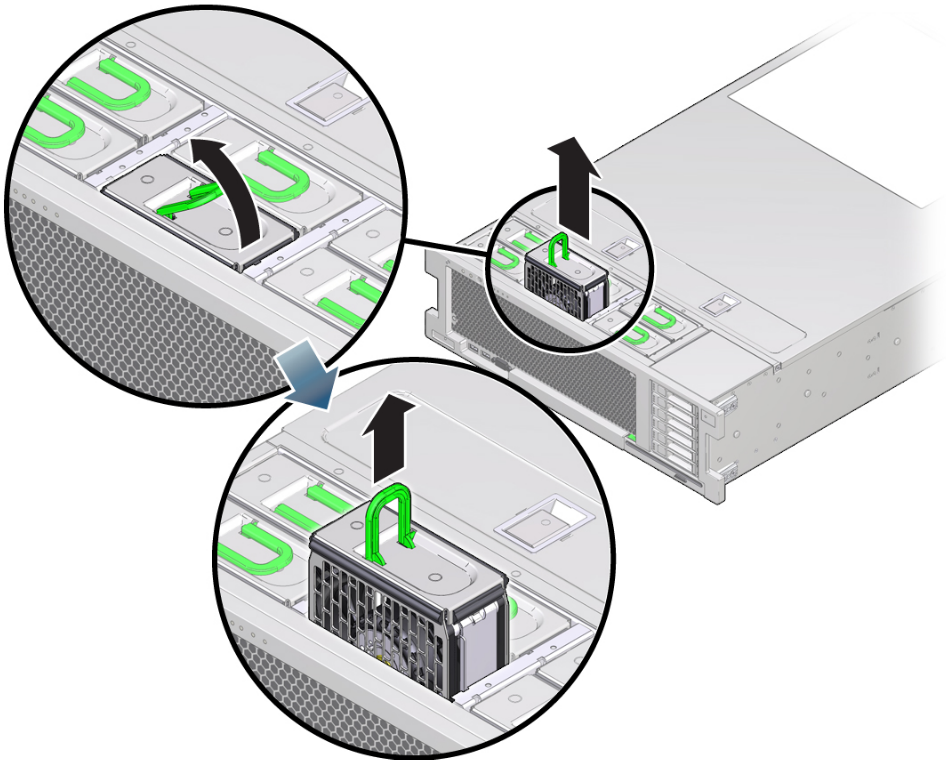
2. **Identify the faulty fan module with a corresponding Service Required LED.**

The Service Action Required LEDs are located on the fan module as shown in "Locate a Faulty Fan Module" on page 78.

3. **Using your thumb and forefinger, grasp the handle on the fan module and lift it out of the server.**

Caution - When removing a fan module, do not rock it back and forth. Rocking fan modules can damage the fan board connectors.

Caution - When changing fan modules, note that only the fan modules can be removed or replaced. Do not service any other components in the fan compartment unless the server is shut down and the power cords are removed.



4. **Install a new fan module.**

   See "Install a Fan Module" on page 81.

Related Information

- “Extend the Server to the Service Position” on page 58
- “Install a Fan Module” on page 81

Install a Fan Module

Before You Begin

Caution - To ensure proper cooling, ensure that you install the replacement fan module in the same slot from which the faulty fan was removed.

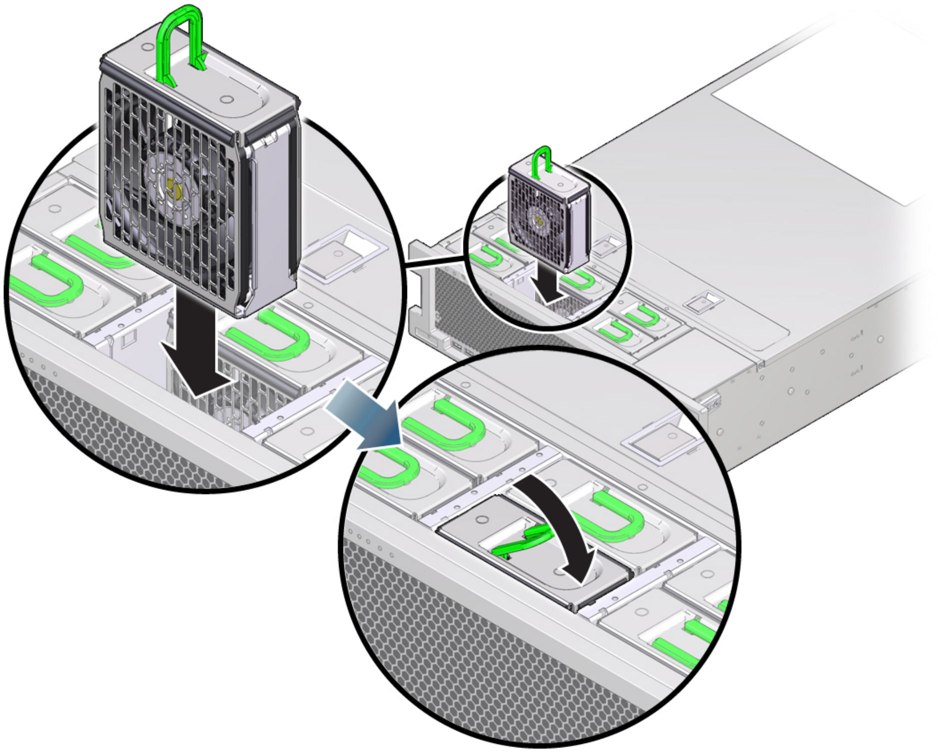
---

1. **Remove a fan module.**

   See “Remove a Fan Module” on page 79.

2. **Unpack the replacement fan module and place it on an antistatic mat.**

3. **Install the replacement fan module into the server by completing the following tasks.**



a. **Align the fan module and slide it into the fan slot.**

Note - Fan modules are keyed to ensure that they are installed in the correct orientation.

---

b. **Apply firm pressure to fully seat the fan module.**

You will hear a click when the fan is properly seated.

4. **Return the server to the normal operating position.**

   See "Return the Server to the Normal Operating Position" on page 160.

Related Information

- "Return the Server to the Normal Operating Position" on page 160.
- "Remove a Fan Module" on page 79
- "Verify Fan Module Functionality" on page 82

▼ Verify Fan Module Functionality

1. **Verify that the Service Required LED on the replaced fan module is not lit.**

   See "Fan Module LEDs" on page 78.

2. **Verify that the Top Fan LED and the Service Required LED on the front of the server are not lit.**

   See "Front Panel Controls and LEDs" on page 34.

Note - If you are replacing a fan module when the server is powered down, the LEDs might stay lit until power is restored to the server and the server can determine that the fan module is functioning properly.

---

3. **Use the Oracle ILOM `show faulty` command to verify that the fault has been cleared.**

   See "Managing Faults" on page 42 for more information on using the `show faulty` command.

4. **Perform one of the following tasks based on your verification results:**

   - If the previous steps did not clear the fault, see "Detecting and Managing Faults" for information about the tools and methods you can use to diagnose component faults.
   - If the previous steps indicate that no faults have been detected, then the component has been replaced successfully. No further action is required.

Related Information

- "Locate a Faulty Fan Module" on page 78
- "Front Panel Components (Service)" on page 13
- "Rear Panel Components (Service)" on page 15

Servicing Power Supplies

This server has redundant hot-serviceable power supplies. You can remove and replace a power supply without shutting the server down, provided that the other power supply is online and working.

The server offers two redundancy modes for the power supplies. Light Load Efficiency Mode places PS1 in a warm standby condition while PS0 carries the entire load more efficiently by itself. If PS0 loses AC power or is removed, PS1 takes over the load automatically. Some rare internal failures of PS0 could cause the server to lose power faster than PS1 can take over.

Disabling the Light Load Efficiency Mode Policy causes the power supplies to share the load at all times, at the expense of efficiency during light loads. For information about configuration policies, refer to *Servers Administration* and the Oracle ILOM documentation.

These topics describe how to service power supply modules.

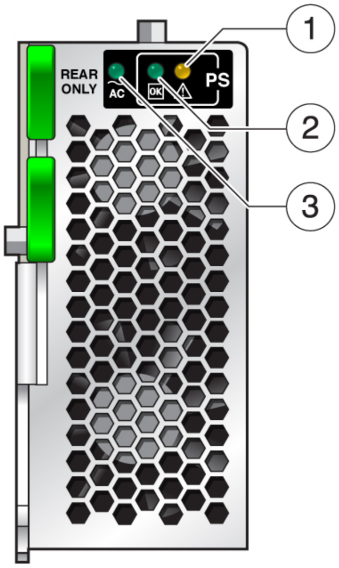
- "Power Supply LEDs" on page 85
- "Locate a Faulty Power Supply" on page 87
- "Remove a Power Supply" on page 87
- "Install a Power Supply" on page 89
- "Verify Power Supply Functionality" on page 90

Related Information

- "Servicing the PS Backplane"

Power Supply LEDs

Each power supply has LEDs that indicate its state.



No.	LED	Symbol	Color	Status When Lit
1	Service Action Required	⚠	Amber	The power supply is faulty. Service action is required.
2	OK	OK	Green	Both DC outputs (3.3V standby and 12V main) are active and within regulation.
3	AC Present	~AC	Green	AC voltage is applied to the power supply.

Note - The front and rear panel Service Action Required LEDs are also lit when the server detects a power supply fault. See "Front Panel Components (Service)" on page 13 and "Rear Panel Components (Service)" on page 15.

Related Information

- "Locate a Faulty Power Supply" on page 87
- "Verify Power Supply Functionality" on page 90

Locate a Faulty Power Supply

- **View the following LEDs, which are lit when a power supply fault is detected.**
  - Rear PS Fault LED on the front bezel of the server. See "Front Panel Components (Service)" on page 13.
  - Service Action Required LED on the faulted power supply. See "Power Supply LEDs" on page 85.

Note - The front and rear panel Service Action Required LEDs are also lit when the server detects a power supply fault. See "Front Panel Components (Service)" on page 13 and "Rear Panel Components (Service)" on page 15.

Related Information

- "Power Supply LEDs" on page 85
- "Front Panel Components (Service)" on page 13
- "Rear Panel Components (Service)" on page 15
- "Remove a Power Supply" on page 87

Remove a Power Supply

Caution - Hazardous voltages are present. To reduce the risk of electric shock and danger to personal health, follow the instructions.

Caution - If a power supply fails and you do not have a replacement available, to ensure proper airflow, leave the failed power supply installed in the server until you replace it with a new power supply.

A customer can perform this procedure while the server is running. See "Component Service Categories" on page 53 for more information about hot service procedures.

1. **Prepare for servicing.**

   a. **Attach an antistatic wrist strap.**

   b. **If necessary, release the cable management arm to access the power supplies.**

   See "Release the CMA" on page 60.

   Do not allow the CMA to hang unsupported while it is unattached.

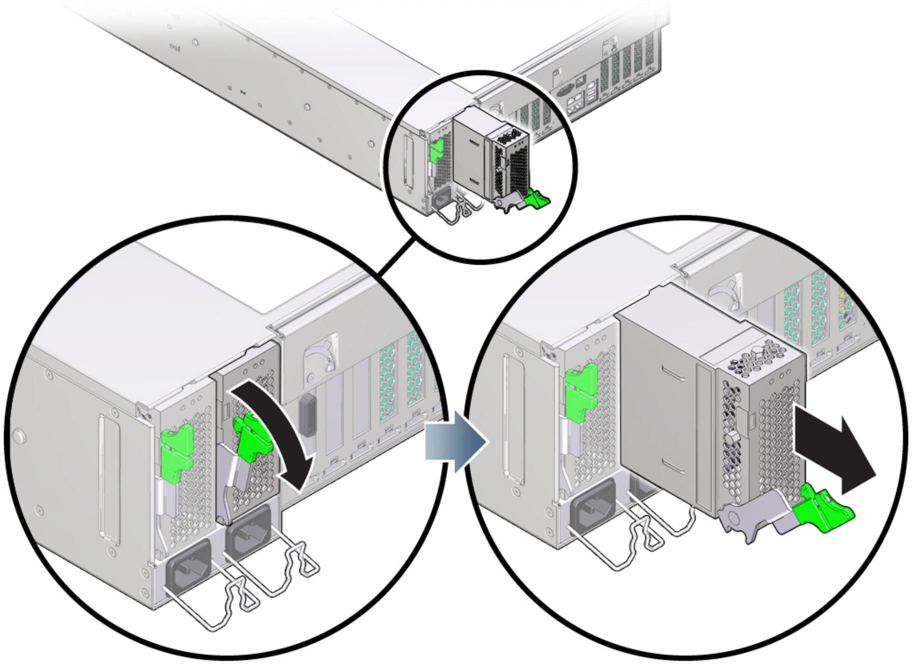
2. **Disconnect the power cord from the power supply that displays an amber lit Service Action Required LED.**

3. **Press down on the release latch to open the ejector arm.**

4. **Slide the power supply out of the chassis.**

Caution - There is no “catch” mechanism on the power supply to prevent it from sliding completely out of the chassis. Use care when removing the power supply to prevent it from falling.

Caution - Whenever you remove a power supply, you should replace it with another power supply. Otherwise, the server might overheat due to improper airflow. If a new power supply is not available, leave the failed power supply installed until it can be replaced.



5. **Install a new power supply.**

   See “Install a Power Supply” on page 89.

Related Information

- “Locate a Faulty Power Supply” on page 87
- “Install a Power Supply” on page 89

▼ Install a Power Supply

Caution - Install an A239A power supply, labeled for upright installation, in the server. The A239A power supply correctly exhausts air from the rear of the server. Do not install an A239 power supply, which might cause the server to overheat and shut down.

---

1. **Remove a power supply.**

   See “Remove a Power Supply” on page 87.

2. **If necessary, release the cable management arm to access the power supplies.**

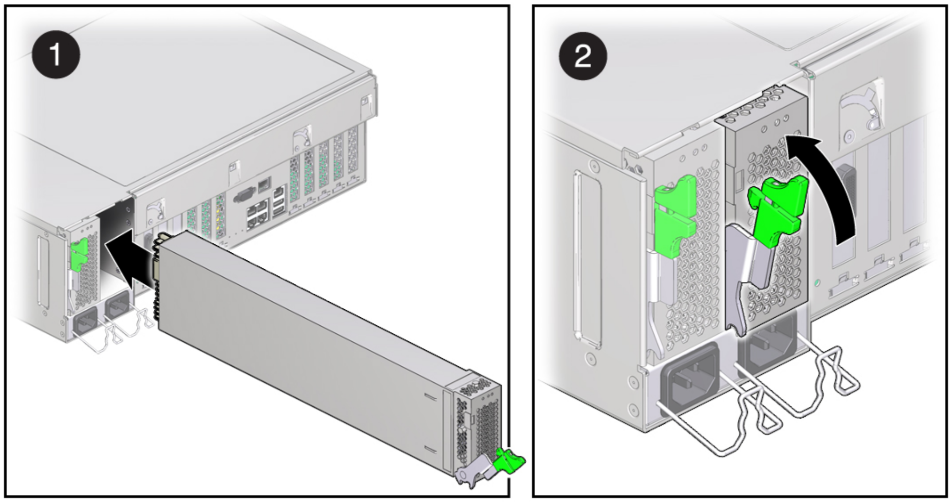
   See “Release the CMA” on page 60.

   Do not allow the CMA to hang unsupported while it is unattached.

3. **Align the power supply with the empty power supply chassis bay.**

4. **Slide the power supply into the bay until it is fully seated.**

5. **Move the release latch up to secure the power supply in place.**



6. **Reconnect the power cord to the power supply.**

7. **Verify that the AC OK LED is lit.**

   See "Locate a Faulty Power Supply" on page 87.

8. **Verify that the following LEDs are not lit:**

   - Service Action Required LED on the power supply
   - Front and rear Service Action Required LEDs
   - Rear PS Failure LED on the bezel of the server

   See "Interpreting LEDs" on page 33.

9. **Verify power supply functionality.**

   See "Verify Power Supply Functionality" on page 90.

Related Information

- "Remove a Power Supply" on page 87
- "Verify Power Supply Functionality" on page 90

▼ Verify Power Supply Functionality

1. **Verify that the amber Service Required LED on the replaced power supply is not lit.**

2. **Verify that the PS Fault LED on the front of the server is not lit.**

3. **Use the Oracle ILOM `show faulty` command to verify that the fault has been cleared.**

   See "Check for Faults" on page 43 for more information on using the `show faulty` command.

4. **Perform one of the following tasks based on your verification results:**

   - If the previous steps did not clear the fault, see "Detecting and Managing Faults" for information about the tools and methods you can use to diagnose component faults.
   - If the previous steps indicate that no faults have been detected, then the component has been replaced successfully. No further action is required.

Related Information

- "Locate a Faulty Power Supply" on page 87
- "Front Panel Components (Service)" on page 13
- "Rear Panel Components (Service)" on page 15

Servicing Memory Risers and DIMMs

These topics explain how to remove and install memory risers and DIMMs in the server.

- "Memory Riser and DIMM FRU Names" on page 91
- "Memory Riser and DIMM Configuration" on page 93
- "DIMM Rank Classification Labels" on page 94
- "Locate a Failed DIMM (LEDs)" on page 94
- "Locate a Failed DIMM (Oracle ILOM)" on page 96
- "Remove a Memory Riser and DIMM" on page 96
- "Install a DIMM and a Memory Riser" on page 99
- "Enable and Verify Newly Installed DIMMs" on page 102

Memory Riser and DIMM FRU Names

The 2-processor server includes eight memory risers. The 1-processor server includes four memory risers. Four memory risers are associated with each CMP in the server. A label is next to each memory riser that shows the number of the CMP and of the riser. Four DIMM slots are on each memory riser.

Note - The server fails to boot unless all memory riser slots are populated. For more information about memory riser configuration, see "Memory Riser and DIMM Configuration" on page 93.

DIMM FRU names are based on the location of the memory riser in the server and the DIMM slot on the memory riser. For example, the full FRU name for the top-most DIMM slot (`BOB1/CH1/D0`) on the first memory riser (`CMP0/MR0`) is:

```
/SYS/MB/CMP0/MR0/BOB1/CH1/D0
```

Memory Riser Label	Memory Riser or DIMM FRU Name	Ejector Color	Slot Body Color
CM0/MR0	`/SYS/MB/CM0/CMP/MR0` (riser)		
(Farthest from power supplies)	`/SYS/MB/CM0/CMP/MR0/BOB0/CH0/D0`	Black	Black

Memory Riser Label	Memory Riser or DIMM FRU Name	Ejector Color	Slot Body Color
	`/SYS/MB/CM0/CMP/MR0/BOB0/CH1/D0`	Black	White
	`/SYS/MB/CM0/CMP/MR0/BOB1/CH0/D0`	White	Black
	`/SYS/MB/CM0/CMP/MR0/BOB1/CH1/D0`	White	White
CM0/MR1	`/SYS/MB/CM0/CMP/MR1` (riser)		
	`/SYS/MB/CM0/CMP/MR1/BOB0/CH0/D0`	Black	Black
	`/SYS/MB/CM0/CMP/MR1/BOB0/CH1/D0`	Black	White
	`/SYS/MB/CM0/CMP/MR1/BOB1/CH0/D0`	White	Black
	`/SYS/MB/CM0/CMP/MR1/BOB1/CH1/D0`	White	White
CM0/MR2	`/SYS/MB/CM0/CMP/MR2` (riser)		
	`/SYS/MB/CM0/CMP/MR2/BOB0/CH0/D0`	Black	Black
	`/SYS/MB/CM0/CMP/MR2/BOB0/CH1/D0`	Black	White
	`/SYS/MB/CM0/CMP/MR2/BOB1/CH0/D0`	White	Black
	`/SYS/MB/CM0/CMP/MR2/BOB1/CH1/D0`	White	White
CM0/MR3	`/SYS/MB/CM0/CMP/MR3` (riser)		
	`/SYS/MB/CM0/CMP/MR3/BOB0/CH0/D0`	Black	Black
	`/SYS/MB/CM0/CMP/MR3/BOB0/CH1/D0`	Black	White
	`/SYS/MB/CM0/CMP/MR3/BOB1/CH0/D0`	White	Black
	`/SYS/MB/CM0/CMP/MR3/BOB1/CH1/D0`	White	White
CM1/MR0	`/SYS/MB/CM1/CMP/MR0` (riser)		
(Not on the 1-processor server.)	`/SYS/MB/CM1/CMP/MR0/BOB0/CH0/D0`	Black	Black
	`/SYS/MB/CM1/CMP/MR0/BOB0/CH1/D0`	Black	White
	`/SYS/MB/CM1/CMP/MR0/BOB1/CH0/D0`	White	Black
	`/SYS/MB/CM1/CMP/MR0/BOB1/CH1/D0`	White	White
CM1/MR1	`/SYS/MB/CM1/CMP/MR1` (riser)		
(Not on the 1-processor server.)	`/SYS/MB/CM1/CMP/MR1/BOB0/CH0/D0`	Black	Black
	`/SYS/MB/CM1/CMP/MR1/BOB0/CH1/D0`	Black	White
	`/SYS/MB/CM1/CMP/MR1/BOB1/CH0/D0`	White	Black
	`/SYS/MB/CM1/CMP/MR1/BOB1/CH1/D0`	White	White
CM1/MR2	`/SYS/MB/CM1/CMP/MR2` (riser)		
(Not on the 1-processor server.)	`/SYS/MB/CM1/CMP/MR2/BOB0/CH0/D0`	Black	Black

Memory Riser Label	Memory Riser or DIMM FRU Name	Ejector Color	Slot Body Color
	`/SYS/MB/CM1/CMP/MR2/BOB0/CH1/D0`	Black	White
	`/SYS/MB/CM1/CMP/MR2/BOB1/CH0/D0`	White	Black
	`/SYS/MB/CM1/CMP/MR2/BOB1/CH1/D0`	White	White
CM1/MR3 (Not on the 1-processor server.) (Closest to power supplies)	`/SYS/MB/CM1/CMP/MR3` (riser)		
	`/SYS/MB/CM1/CMP/MR3/BOB0/CH0/D0`	Black	Black
	`/SYS/MB/CM1/CMP/MR3/BOB0/CH1/D0`	Black	White
	`/SYS/MB/CM1/CMP/MR3/BOB1/CH0/D0`	White	Black
	`/SYS/MB/CM1/CMP/MR3/BOB1/CH1/D0`	White	White

Related Information

- "Memory Riser and DIMM Configuration" on page 93
- "DIMM Rank Classification Labels" on page 94

Memory Riser and DIMM Configuration

The memory riser configuration rules for the server are as follows:

- The 2-processor server contains eight memory risers. The 1-processor server contains four memory risers. Four memory risers are supported per CPU.
- Each of the memory riser slots in the server must be filled with a memory riser.

The DIMM configuration rules for each memory riser are as follows:

- Each slot on a memory riser must be filled with a DIMM.
- All memory risers must contain the same type of DIMM.

Related Information

- "Memory Riser and DIMM FRU Names" on page 91
- "DIMM Rank Classification Labels" on page 94
- "Locate a Failed DIMM (LEDs)" on page 94
- "Remove a Memory Riser and DIMM" on page 96
- "Install a DIMM and a Memory Riser" on page 99

DIMM Rank Classification Labels

Each DIMM is shipped with a label identifying its rank classification. The following table identifies the corresponding rank classification label shipped with each DIMM.

Note - Single-rank DIMMs are not currently offered.

DIMM Capacity	DRAM Density	Rank Classification	Label
8 GB	4 GB	Dual-rank x4	2Rx4
16 GB	4 GB	Dual-rank x4	2Rx4
32 GB	4 GB	Quad-rank x4	4Rx4

Related Information

- "Memory Riser and DIMM FRU Names" on page 91
- "Memory Riser and DIMM Configuration" on page 93
- "Locate a Failed DIMM (LEDs)" on page 94
- "Remove a Memory Riser and DIMM" on page 96
- "Install a DIMM and a Memory Riser" on page 99

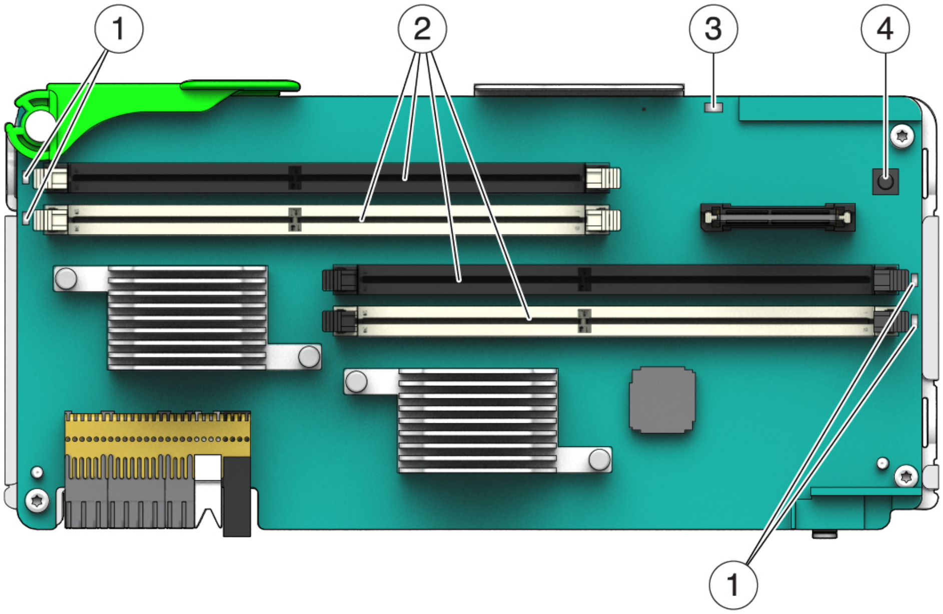
▼ Locate a Failed DIMM (LEDs)

Each memory riser has a Remind button, a Power LED, and Fault LEDs adjacent to each DIMM. This procedure describes how to identify a faulty DIMM using these buttons and LEDs.

1. **Press the System Remind button to identify the memory riser that contains the faulty DIMM.**

2. **Lift and remove the faulty memory riser.**

3. **Press the Remind button on the memory riser to identify the faulty DIMM. An amber Fault LED will light next to the faulty DIMM.**



No.	LED	Color	Description
1	DIMM Fault LED	Amber	Identifies each faulty or misconfigured DIMM when you press the memory riser remind button.
2	DIMM slots		A notch toward the middle of each slot ensures that the DIMM is correctly oriented.
3	Memory riser power LED	Green	Indicates that the riser is operating normally.
		Amber	Indicates that the riser has a fault.
4	Memory riser remind button	Blue	Push this button to identify the faulty or misconfigured DIMMs.

Note - The front and rear panel Service Required LEDs are also lit when the server detects a DIMM fault.

Related Information

- "Locate a Failed DIMM (Oracle ILOM)" on page 96
- "Remove a Memory Riser and DIMM" on page 96

Locate a Failed DIMM (Oracle ILOM)

The Oracle ILOM `show faulty` command displays current faults, including DIMM failures.

1. **Type `show faulty` at the Oracle ILOM prompt.**

```
-> show faulty
Target              | Property          | Value
--------------------+-------------------+-------------------
/SP/faultmgmt/0     | fru               | /SYS/MB/CM0/CMP/MR1/BOB1/CH0/D0
/SP/faultmgmt/0     | timestamp         | Dec 21 16:40:56
/SP/faultmgmt/0/    | timestamp         | Dec 21 16:40:56 faults/0
/SP/faultmgmt/0/    | sp_detected_fault | /SYS/MB/CM0/CMP/MR1/BOB1/CH0/D0
faults/0            |                   | Forced fail(POST)
```

2. **Locate the DIMM that corresponds to the listed name.**

   See "Memory Riser and DIMM FRU Names" on page 91.

   In this example, `/SYS/MB/CM0/CMP/MR1/BOB1/CH0/D0` indicates the memory riser that is second farthest from the power supplies and the DIMM in a slot with white handles and a black slot.

Related Information

- "Locate a Failed DIMM (LEDs)" on page 94
- "Remove a Memory Riser and DIMM" on page 96

Remove a Memory Riser and DIMM

Caution - These procedures require that you handle components that are sensitive to ESD. This sensitivity can cause the component to fail. To avoid damage, ensure that you follow antistatic practices as described in "ESD Measures" on page 50.

A customer can perform this procedure. The system must be completely powered down before performing this procedure. See "Component Service Categories" on page 53 for more information about cold-service procedures.

1. **Prepare for servicing:**

   a. **Attach an antistatic wrist strap.**

   b. **Power off the server and unplug power cords from the power supplies.**

      See "Removing Power From the Server" on page 54.

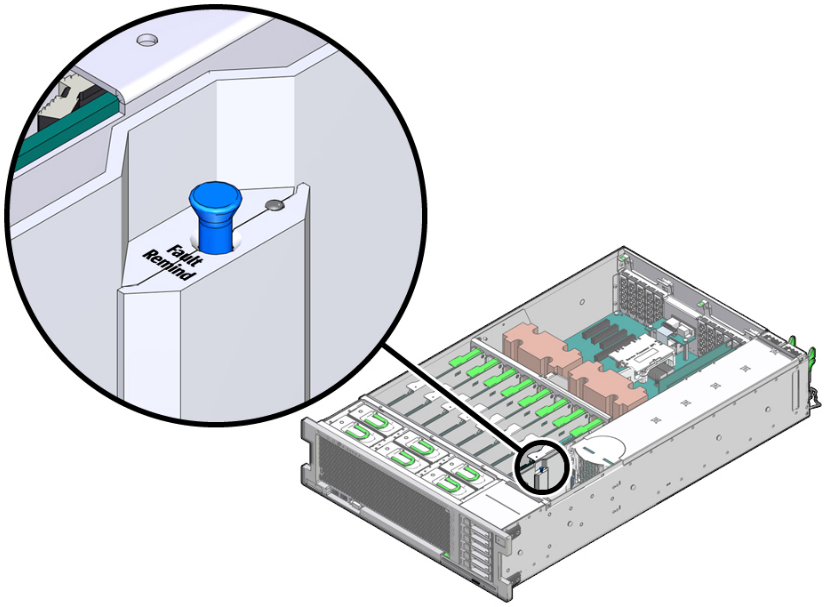
c. **Extend the server to the maintenance position.**

   See "Extend the Server to the Service Position" on page 58.

d. **Remove the top cover.**

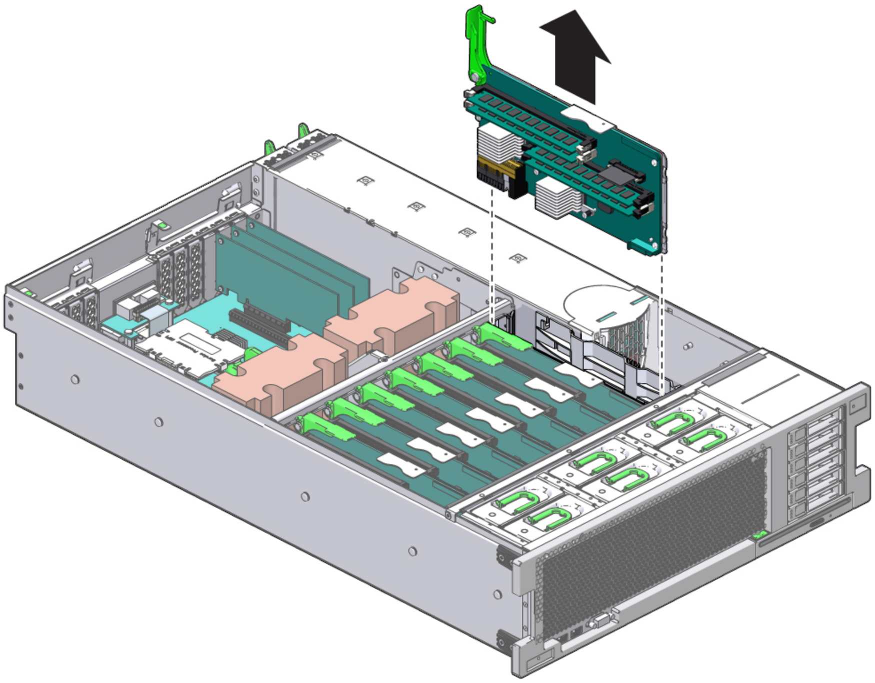
   See "Remove the Top Cover" on page 62.

2. **Identify the memory riser with the faulty DIMM by pressing the Fault Remind button on the air divider as shown in the following figure.**



- **If the memory riser Service Action Required LED is off, all DIMMs on this riser are operating properly.**
- **If the memory riser Service Action Required LED is on (amber), one or more of the DIMMs installed on this riser is faulty or misconfigured.**

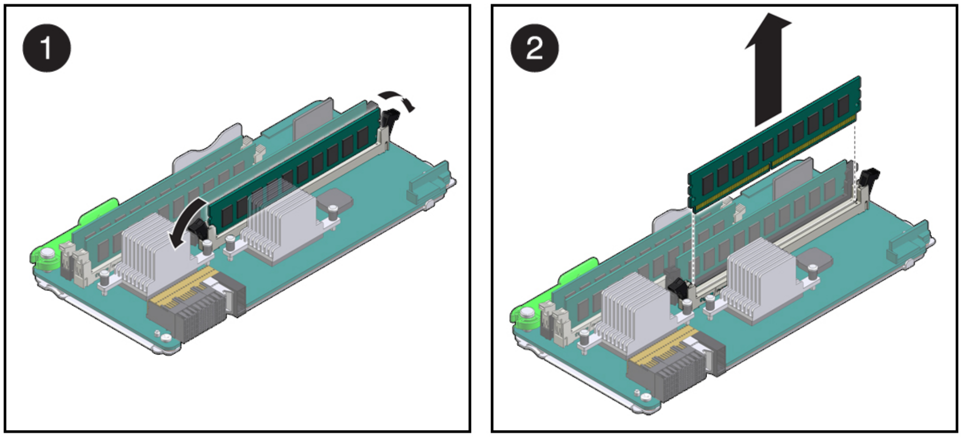
3. **Lift the memory riser that has a lit Service Action Required LED straight up to remove the memory riser from the memory module socket.**



4. **Identify the faulty or misconfigured DIMMs by pressing the Remind button on the memory riser.**

   See “Locate a Failed DIMM (LEDs)” on page 94.

5. **On DIMMs that display an amber Fault LED, remove the DIMMs.**



a. **Press down both DIMM slot ejector tabs as far as they will go.**

b. **Carefully lift the DIMM straight up.**

Caution - Whenever you remove a memory riser or DIMM, you should replace it with another memory riser or DIMM. Otherwise, the server might overheat due to improper airflow.

---

6. **Install DIMMs in the memory riser and return the memory riser to the server.**

   See "Install a DIMM and a Memory Riser" on page 99.

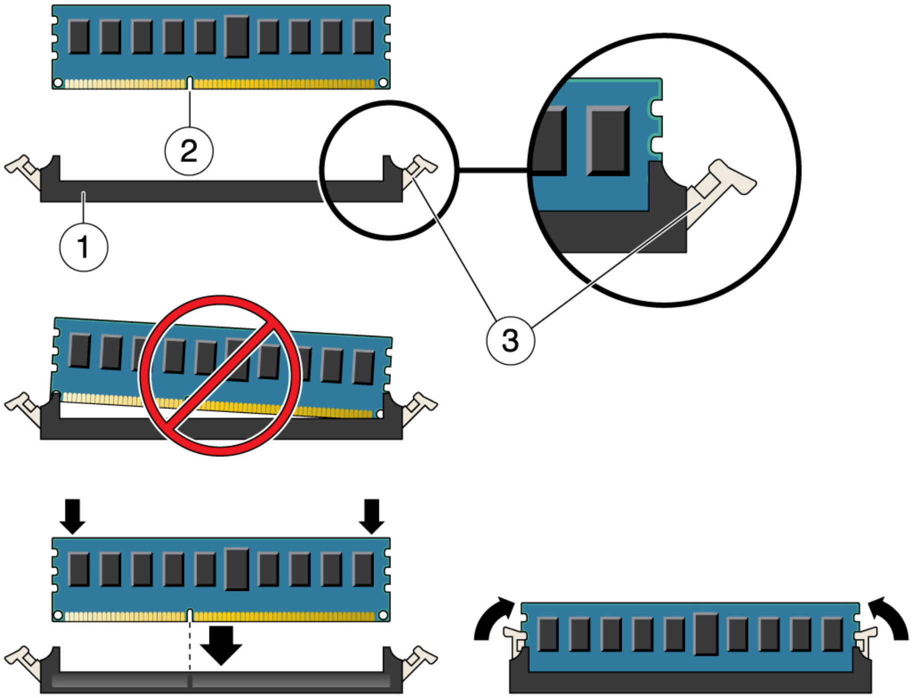
Related Information

- "Install a DIMM and a Memory Riser" on page 99

▼ Install a DIMM and a Memory Riser

1. **Attach an antistatic wrist wrap and unpack the DIMMs and place them on an antistatic mat.**

2. **Install the DIMMs into the memory riser by performing the following tasks.**



No.	Description
1.	DIMM connector slot
2.	DIMM connector key
3.	DIMM ejector lever

a. **Ensure that the ejector levers at both ends of the memory module slot are in a fully open position.**

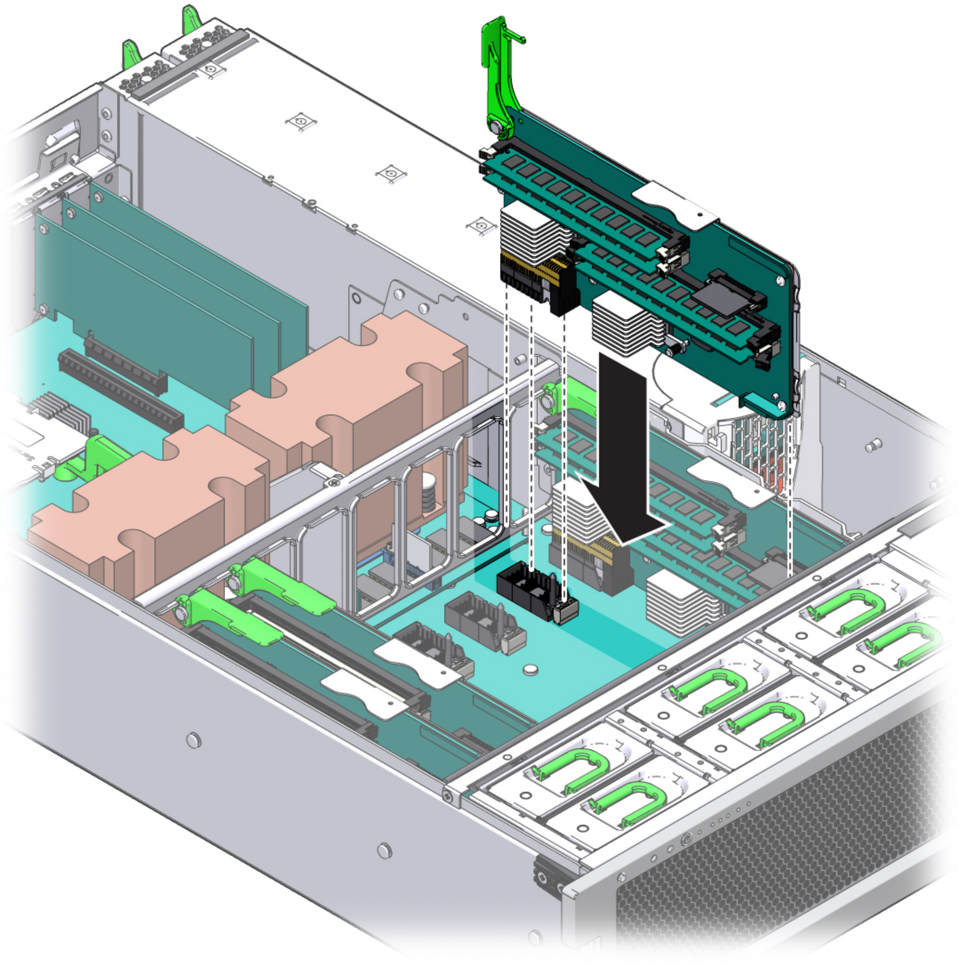
b. **Align each DIMM with the empty connector slot, aligning the notch in the DIMM with the key in the connector.**

   The notch ensures that the DIMM is oriented correctly.

c. **Gently press the DIMM into the slot until the ejector tabs lock the DIMM in place.**

Repeat these steps until each DIMM has been installed.

3. **Push the memory riser module into the associated CPU memory riser slot until the riser module locks in place.**



4. **Return the server to operation:**

   a. **Install the top cover.**
   See “Replace the Top Cover” on page 159.

   b. **Return the server to the normal operating position.**
   See “Return the Server to the Normal Operating Position” on page 160.

   c. **Reinstall the power cords to the power supplies and power on the server.**

See "Returning the Server to Operation".

Related Information

- "Memory Riser and DIMM Configuration" on page 93
- "Remove a Memory Riser and DIMM" on page 96
- "Enable and Verify Newly Installed DIMMs" on page 102

Enable and Verify Newly Installed DIMMs

1. **Access the Oracle ILOM prompt.**

   Refer to *Servers Administration* for instructions.

2. **Use the `show faulty` command to determine how to clear the fault.**

   - If `show faulty` indicates a POST-detected fault, go to Step 3.
   - If `show faulty` output displays a UUID, which indicates a host-detected fault, skip Step 3 and go directly to Step 4.

3. **Use the `set` command to enable the DIMM that was disabled by POST.**

   In most cases, replacement of a faulty DIMM is detected when the service processor is power cycled. In those cases, the fault is automatically cleared from the server. If `show faulty` still displays the fault, the `set` command will clear it.

```
-> set /SYS/MB/CM0/CMP/MR3/BOB1/CH0/D0 component_state=Enabled
```

4. **For a host-detected fault, perform the following steps to verify the new DIMM:**

   a. **Set the virtual keyswitch to `diag` so that POST will run in Service mode.**

```
-> set /HOST keyswitch_state=Diag
Set 'keyswitch_state' to 'Diag'
```

   b. **Power cycle the server.**

```
-> stop /System
Are you sure you want to stop /System (y/n)? y
Stopping /System
-> start /System
Are you sure you want to start /System (y/n)? y
Starting /System
```

c. **Check if the host has been powered off.**

Allow approximately one minute before performing this step. Type the `show /HOST` command. When the host is powered off, the console displays `status=Powered Off`.

d. **Switch to the system console to view POST output.**

Watch the POST output for possible fault messages. The following output indicates that POST did not detect any faults:

```
-> start /SYS/console
...
0:0:0>INFO:
0:0:0>    POST Passed all devices.
0:0:0>POST:    Return to VBSC.
0:0:0>Master set ACK for vbsc runpost command and spin...
```

Note - The server might boot automatically at this point. If so, go directly to Step 4.f. If the server remains at the OpenBoot prompt (`ok`) go to Step 4.e.

---

e. **If the server remains at the OpenBoot prompt, type `boot`.**

f. **Return the virtual keyswitch to Normal mode.**

```
-> set /HOST keyswitch_state=Normal
Set 'keyswitch_state' to 'Normal'
```

g. **Switch to the system console and type the Oracle Solaris `fmadm faulty` command.**

```
# fmadm faulty
```

If any faults are reported, refer to the diagnostics instructions described in "Check for Faults" on page 43.

5. **Switch to the Oracle ILOM command shell.**

6. **Run the `show faulty` command.**

```
-> show faulty
Target              | Property               | Value
--------------------+------------------------+------------------------------
/SP/faultmgmt/0     | fru                    | /SYS/MB/CMP0/MR1/BOB1/CH0/D0
/SP/faultmgmt/0     | timestamp              | Dec 14 22:43:59
/SP/faultmgmt/0/    | sunw-msg-id            | SUN4V-8000-DX
```

```
faults/0            |                        |
/SP/faultmgmt/0/    | uuid                   | 3aa7c854-9667-e176-efe5-e487e520
faults/0            |                        | 7a8a
/SP/faultmgmt/0/    | timestamp              | Dec 14 22:43:59
faults/0            |                        |
```

If the `show faulty` command reports a fault with a UUID go to Step 7. If `show faulty` does *not* report a fault with a UUID, you are done with the verification process.

7. **Switch to the system console and type the `fmadm repair` command with the UUID.**

   Use the same UUID that was displayed from the output of the Oracle ILOM `show faulty` command.

```
# fmadm repair 3aa7c854-9667-e176-efe5-e487e520
```

Servicing the DVD Drive

The DVD drive is mounted in a removable module that is accessed from the system's front panel. See "Front Panel Components (Service)" on page 13. The DVD module must be removed from the drive cage in order to service the drive backplane.

Caution - If you remove the DVD drive you should replace it with a DVD drive filler panel. Otherwise the server might overheat due to improper airflow.

These topics describe how to service a DVD drive.

- "Remove a DVD Drive or Filler Panel" on page 105
- "Install a DVD Drive or Filler Panel" on page 106

Related Information

- "Filler Panels" on page 51

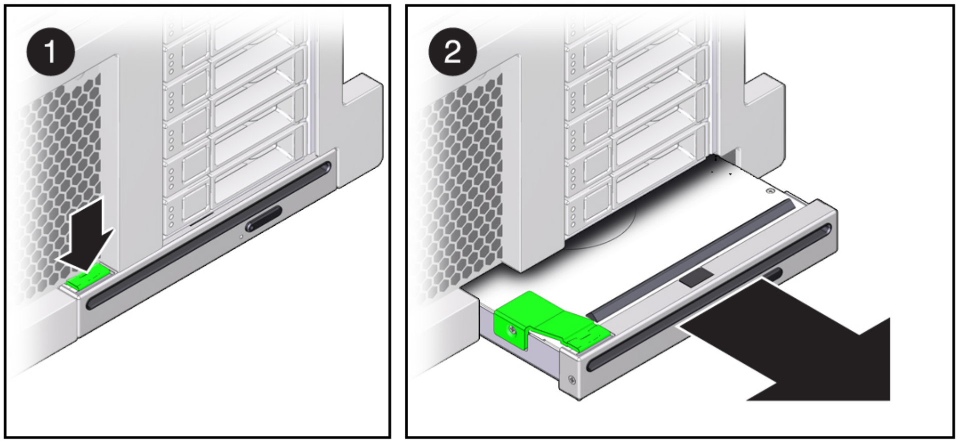
▼ Remove a DVD Drive or Filler Panel

A customer can perform this procedure. The server must be completely powered down before performing this procedure. See "Component Service Categories" on page 53 for more information about cold-service procedures.

1. **Prepare for servicing.**
    a. **Attach an antistatic wrist strap.**
    b. **Remove any media from the drive.**
    c. **Power off the server and unplug power cords from the power supplies.**
    See "Removing Power From the Server" on page 54.
2. **Push down on the latch on the top left corner of the DVD drive or filler panel.**

3. **Slide the DVD drive or filler panel out of the server.**

Caution - Whenever you remove the DVD drive or filler panel, you should replace it with another DVD drive or a filler panel. Otherwise the server might overheat due to improper airflow.



4. **Install a new DVD drive or a filler panel.**

   See "Install a DVD Drive or Filler Panel" on page 106.

Related Information

- "Install a DVD Drive or Filler Panel" on page 106

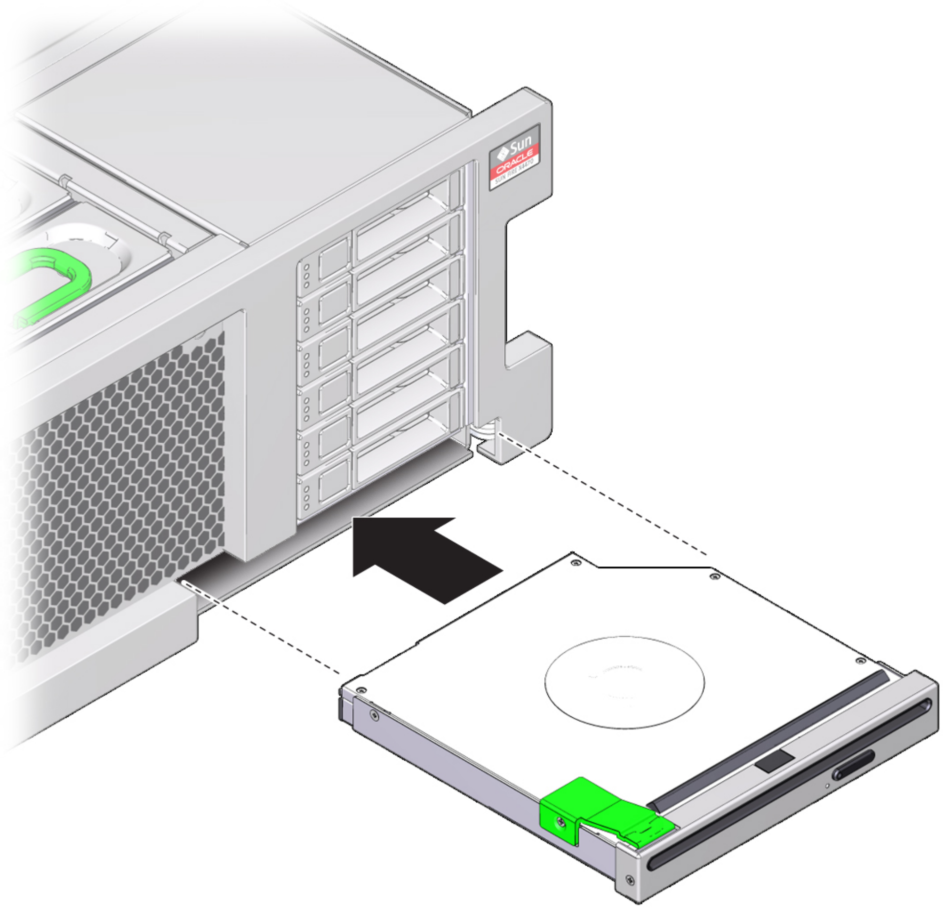
Install a DVD Drive or Filler Panel

A customer can perform this procedure. The server must be completely powered down before performing this procedure. See "Component Service Categories" on page 53 for more information about cold-service procedures.

1. **Unpack the DVD drive or filler panel.**

   If it is a DVD drive, attach an antistatic wrist wrap and place the drive on an antistatic mat.

2. **Slide the DVD drive or filler panel into the front of the chassis until it seats.**



3. **Return the server to operation.**

   a. **Return the server to the normal operating position.**

      See “Return the Server to the Normal Operating Position” on page 160.

   b. **Reinstall the power cords to the power supplies and power on the server.**

      See “Returning the Server to Operation”.

Related Information

- “Remove a DVD Drive or Filler Panel” on page 105

Servicing the Battery

The battery is located inside the chassis. See "Motherboard Component Locations" on page 19. The battery maintains system time when the server is powered off and disconnected from AC power. If the IPMI logs indicate a battery failure, replace the battery.

These topics describe how to service the battery.

- "Remove the Battery" on page 109
- "Install the Battery" on page 110

Related Information

- "Detecting and Managing Faults"

▼ Remove the Battery

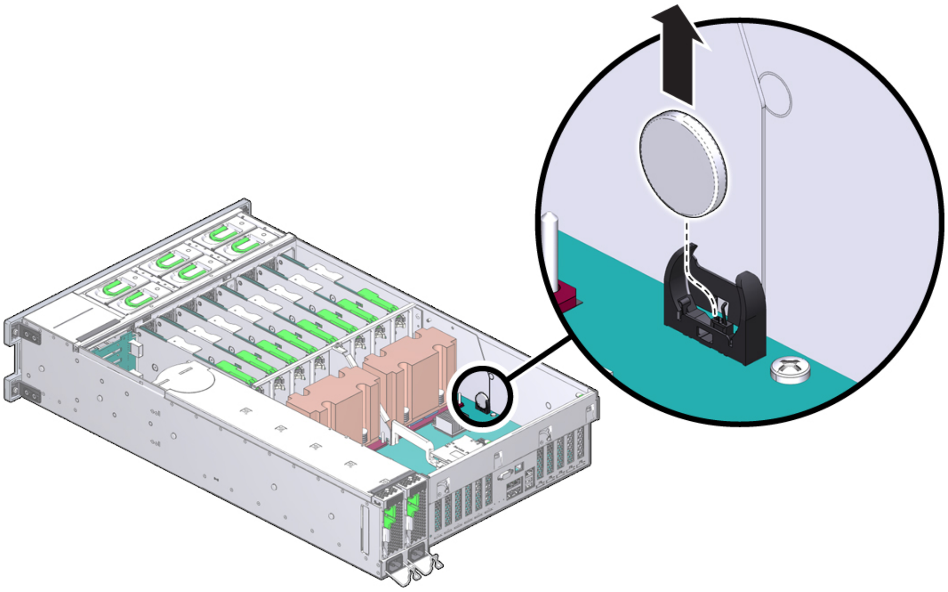
Caution - This procedure requires that you handle components that are sensitive to ESD. This sensitivity can cause the component to fail. To avoid damage, ensure that you follow antistatic practices as described in "ESD Measures" on page 50.

A customer can perform this procedure. The server must be completely powered down before performing this procedure. See "Component Service Categories" on page 53 for more information about cold-service procedures.

1. **Prepare for servicing.**
    a. **Attach an antistatic wrist strap.**
    b. **Power off the server and unplug power cords from the power supplies.**
    See "Removing Power From the Server" on page 54.
    c. **Extend the server to maintenance position.**
    See "Extend the Server to the Service Position" on page 58.
    d. **Remove the top cover.**

See “Remove the Top Cover” on page 62.

2. **Remove the battery from the battery holder by pulling back on the metal tab holding it in place and sliding the battery up and out of the battery holder.**



3. **Install a new battery.**

   See “Install the Battery” on page 110.

Related Information

- “Install the Battery” on page 110

Install the Battery

1. **Remove the battery.**

   See “Remove the Battery” on page 109.

2. **Attach an antistatic wrist wrap and unpack the replacement battery.**

3. **Press the new battery into the battery holder with the positive side (+) facing away from the metal tab that holds it in place.**

If the SP is configured to synchronize with a network time server using NTP, the Oracle ILOM clock will be reset as soon as the server is powered on and connected to the network. Otherwise, proceed to the next step.

4. **If the SP is not configured to use NTP, you must reset the Oracle ILOM clock using the Oracle ILOM CLI or the web interface.**

   For instructions, see the Oracle ILOM documentation.

5. **Return the server to operation.**

   a. **Return the server to the normal operating position.**

      See "Return the Server to the Normal Operating Position" on page 160.

   b. **Reinstall the power cords to the power supplies and power on the server.**

      See "Returning the Server to Operation".

Related Information

- "Remove the Battery" on page 109

Servicing PCIe Cards

These topics describe how to service PCIe cards and PCIe card slot filler panels.

- "PCIe Card Configuration" on page 113
- "I/O Root Complex Connections" on page 114
- "Remove a PCIe Card or Filler Panel" on page 115
- "Install a PCIe Card or Filler Panel" on page 117

PCIe Card Configuration

Note - Before installing PCIe cards, refer to the *SPARC T5-2 Server Product Notes* and the documentation for each PCIe card for detailed information about known issues and configuration limitations.

This server has eight PCI Express 3.0 slots that accommodate low-profile PCIe cards. All slots support x8 PCIe cards. Two slots are also capable of supporting x16 PCIe cards:

- **Slots 1, 2, 3, 6, 7, and 8 –** x8 electrical interface
- **Slots 4 and 5 –** x8 electrical interface (x16 connector)

To determine the slot in which to install a PCIe card, follow these guidelines:

1. Install cards that require a specific slot. Refer to the *SPARC T5-2 Server Product Notes* and the documentation for each card to determine if there are slot requirements.

   The following cards have certain requirements:

   - **Sun Flash Accelerator F80 PCIe card:** You can install six of these cards. If the maximum of six are installed, the remaining two slots cannot contain a Sun Flash Accelerator F40 PCIe card.
   - **Oracle Dual Port QDR Infiniband Adapter M3:** You can install four of these cards. On a 1-processor server, no more than two cards can be in slots 1 to 4, and no more than two cards can be in slots 5 to 8.
2. Install the remaining cards so that the load on the server is balanced.
   - Fill the PCIe slots in this sequence: 1, 8, 2, 7, 3, 6, 4, 5.
   - Place the cards in this order: Expansion cards, storage cards, network cards, other cards.

Related Information

- "I/O Root Complex Connections" on page 114
- "Rear Panel Components (Service)" on page 15
- "Remove a PCIe Card or Filler Panel" on page 115
- "Install a PCIe Card or Filler Panel" on page 117

I/O Root Complex Connections

On the 2-processor server, each CPU connects to four of the PCIe slots. Each PCIe slot also uses a specific I/O subsystem (IOS0 or IOS1) and PCIe Switch (0 or 1)

- CPU0, IOS1, and PCIe Switch 0 connect to slot 1.
- CPU0, IOS0, and PCIe Switch 1 connect to slots 5, 6, and 7.
- CPU1, IOS1, and PCIe Switch 0 connect to slots 2, 3, and 4.
- CPU1, IOS0, and PCIe Switch 1 connect to slot 8.

On the 1-processor server, the single CPU connects to all eight of the PCIe slots. Each PCIe slot uses a specific I/O subsystem (IOS0 or IOS1) and PCIe Switch (0 or 1)

- CPU0, IOS1, and PCIe Switch 0 connect to slot 1, 2, 3, and 4.
- CPU0, IOS0, and PCIe Switch 1 connect to slots 5, 6, 7, and 8.

Note - For diagrams showing connections between PCIe slots and root complexes for the 2-processor and 1-processor servers, see "System Schematic" on page 23.

The `pci@` values reported in the OpenBoot `show-devs` command output are paths in the I/O root complex topology. The values are different for the 2-processor and 1-processor servers.

2-processor server root complex paths:

PCIe Slot	CPU	IOS	PCIe Switch	Root Complex Path	Oracle ILOM Target
1	0	1	0	`/pci@300/pci@1/pci@0/pci@4`	`/SYS/MB/PCIE1`
2	1	1	0	`/pci@380/pci@1/pci@0/pci@5`	`/SYS/MB/PCIE2`
3	1	1	0	`/pci@380/pci@1/pci@0/pci@6`	`/SYS/MB/PCIE3`
4	1	1	0	`/pci@380/pci@1/pci@0/pci@7`	`/SYS/MB/PCIE4`
5	0	0	1	`/pci@340/pci@1/pci@0/pci@4`	`/SYS/MB/PCIE5`
6	0	0	1	`/pci@340/pci@1/pci@0/pci@5`	`/SYS/MB/PCIE6`
7	0	0	1	`/pci@340/pci@1/pci@0/pci@6`	`/SYS/MB/PCIE7`

PCIe Slot	CPU	IOS	PCIe Switch	Root Complex Path	Oracle ILOM Target
8	1	0	1	`/pci@3c0/pci@1/pci@0/pci@7`	`/SYS/MB/PCIE8`

1-processor server root complex paths:

PCIe Slot	CPU	IOS	PCIe Switch	Root Complex Path	Oracle ILOM Target
1	0	1	0	`/pci@300/pci@1/pci@0/pci@4`	`/SYS/MB/PCIE1`
2	0	1	0	`/pci@300/pci@1/pci@0/pci@5`	`/SYS/MB/PCIE2`
3	0	1	0	`/pci@300/pci@1/pci@0/pci@6`	`/SYS/MB/PCIE3`
4	0	1	0	`/pci@300/pci@1/pci@0/pci@7`	`/SYS/MB/PCIE4`
5	0	0	1	`/pci@340/pci@1/pci@0/pci@4`	`/SYS/MB/PCIE5`
6	0	0	1	`/pci@340/pci@1/pci@0/pci@5`	`/SYS/MB/PCIE6`
7	0	0	1	`/pci@340/pci@1/pci@0/pci@6`	`/SYS/MB/PCIE7`
8	0	0	1	`/pci@340/pci@1/pci@0/pci@7`	`/SYS/MB/PCIE8`

Related Information

- “System Schematic” on page 23
- “PCIe Card Configuration” on page 113
- “Rear Panel Components (Service)” on page 15
- “Remove a PCIe Card or Filler Panel” on page 115
- “Install a PCIe Card or Filler Panel” on page 117

Remove a PCIe Card or Filler Panel

Caution - This procedure requires that you handle components that are sensitive to ESD. This sensitivity can cause the component to fail. To avoid damage, ensure that you follow antistatic practices as described in “ESD Measures” on page 50.

A customer can perform this procedure. The server must be completely powered down before performing this procedure. See “Component Service Categories” on page 53 for more information about cold-service procedures.

1. **Prepare for servicing.**
    a. **Attach an antistatic wrist strap.**

  b. **Power off the server and disconnect all power cords from the server power supplies.**

     See “Removing Power From the Server” on page 54.

  c. **Extend the server to the maintenance position.**

     See “Extend the Server to the Service Position” on page 58.

  d. **Remove the top cover.**

     See “Remove the Top Cover” on page 62.

2. **Locate the PCIe card or filler panel that you want to remove.**

   See “Rear Panel Components (Service)” on page 15 for information about PCIe slots and their locations.

   If you are removing a PCIe card slot filler panel, go to Step 6.

3. **If necessary, make a note of the slot location for each PCIe card you plan to remove.**

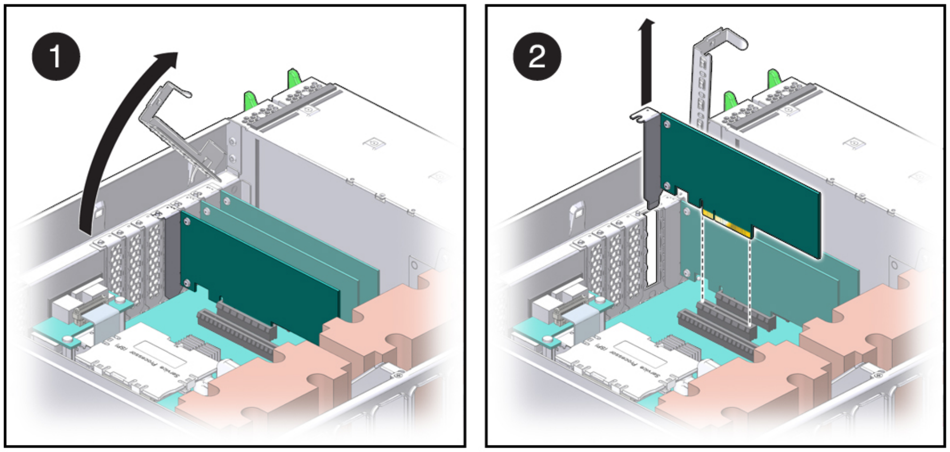
4. **Unplug all data cables from the PCIe card.**

   Note the location of all cables for reinstallation later.

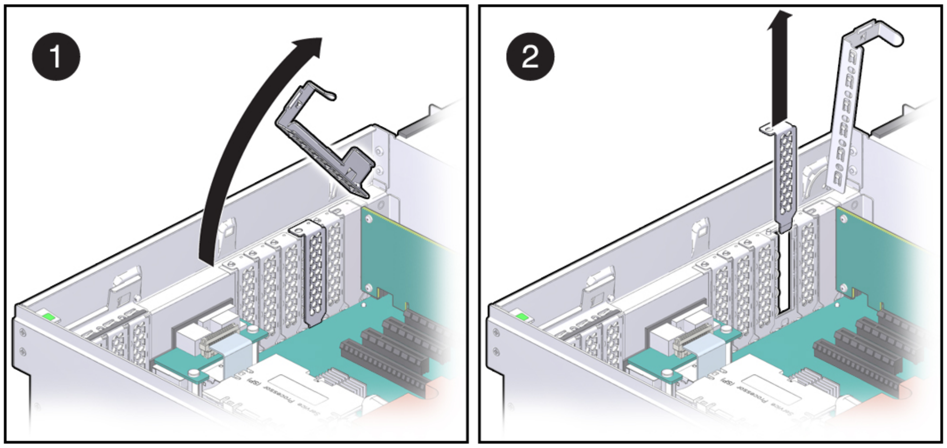
5. **Remove any transceivers from the PCIe card before removing the card.**

6. **Remove the PCIe card by completing the following tasks.**

   - See these figures if you are removing a PCIe card.



- See these figures if you are removing a PCIe card slot filler panel.



   a. **Disengage the PCIe card slot crossbar from its locked position by pulling it toward the interior of the chassis.**

   b. **Rotate the crossbar to an upright position (panel 1).**

   c. **Carefully remove the PCIe card or filler panel from the card slot. (panel 2)**

7. **Replace with another PCIe card or filler panel before the server is connected to power again.**

   See "Install a PCIe Card or Filler Panel" on page 117.

Related Information

- "Install a PCIe Card or Filler Panel" on page 117

▼ Install a PCIe Card or Filler Panel

Caution - This procedure requires that you handle components that are sensitive to ESD. This sensitivity can cause the component to fail. To avoid damage, ensure that you follow antistatic practices as described in "ESD Measures" on page 50.

---

1. **Remove a PCIe card or filler panel.**

   See "Remove a PCIe Card or Filler Panel" on page 115.

2. **Attach an antistatic wrist strap, unpack the PCIe card or PCIe card slot filler panel, and place on an antistatic mat.**

3. **Remove any transceivers from the PCIe card before installing the card.**

4. **Ensure that the server is powered off and all power cords are disconnected from the server power supplies.**

   See "Removing Power From the Server" on page 54.

5. **Determine which slot to install the PCIe card in.**

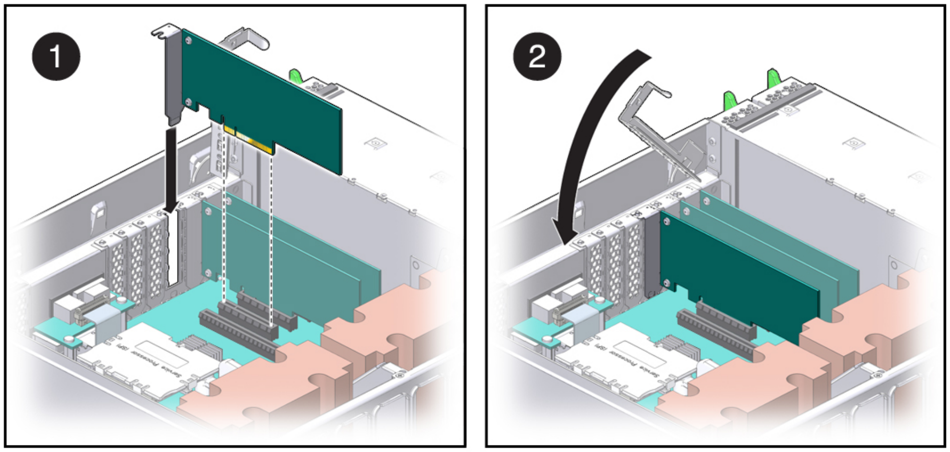
   If you are not replacing an existing PCIe card and need information about deciding which slot to install the card in, see "PCIe Card Configuration" on page 113.

6. **Disengage the PCIe card slot crossbar from its locked position by pulling it toward the interior of the chassis.**

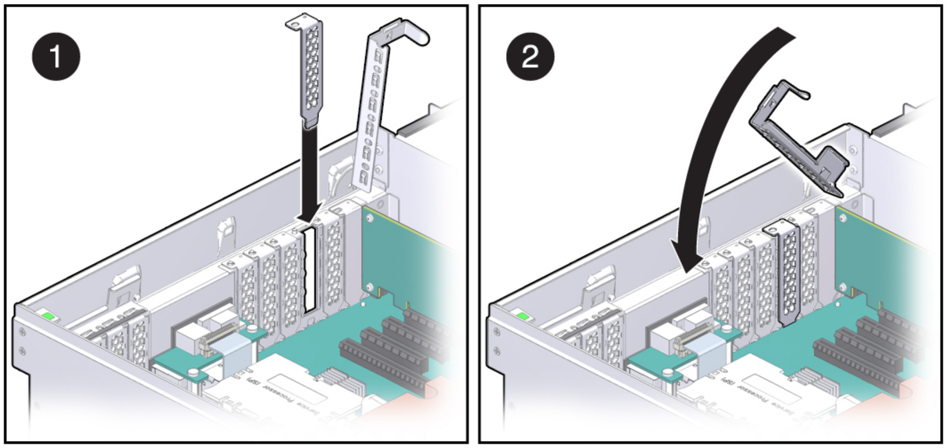
   The crossbar might already be disengaged if you removed a PCIe card or filler panel from that slot.

7. **Install the PCIe card or filler panel into the card slot and return the crossbar to its closed and locked position.**

   - See these figures if you are installing a PCIe card.



   - See these figures if you are installing a PCIe card slot filler panel.



8. **Return the server to operation:**

   a. **Install the top cover.**

      See "Replace the Top Cover" on page 159.

   b. **Return the server to the normal operating position.**

      See "Return the Server to the Normal Operating Position" on page 160.

   c. **Reconnect all power cords to the server power supplies.**

      See "Attach Power Cords" on page 161.

   d. **Power on the server.**

      See "Power On the Server (Oracle ILOM)" on page 162 or "Power On the Server (Power Button)" on page 162.

9. **Refer to the documentation shipped with the PCIe card for information about configuring the PCIe card, including installing required operating systems.**

   To create or recover RAID configurations, refer to the *LSI MegaRAID SAS Software User's Guide*, which is available at:

   `http://www.lsi.com/support/sun`

Related Information

- "Remove a PCIe Card or Filler Panel" on page 115

Servicing the SP

These topics describe how to service the SP.

- "SP Firmware and Configuration" on page 121
- "Remove the SP" on page 122
- "Install the SP" on page 123
- "Verify SP Functionality" on page 125

SP Firmware and Configuration

System firmware consists of two components, an SP component and a host component. The SP firmware component is located on the SP, and the host component is located on the motherboard. For the server to operate correctly, the firmware in these two components must be compatible.

When replacing the SP, you must restore the configuration settings maintained in the SP. Before replacing the SP, save the configuration using the Oracle ILOM backup utility. Refer to the Oracle ILOM documentation for instructions on backing up and restoring the Oracle ILOM configuration.

After replacing the SP, the new SP firmware component and the existing host firmware component must be consistent with each other. To ensure that the firmware is compatible throughout the server, load new system firmware as described in "Install the SP" on page 123.

Related Information

- Oracle ILOM documentation in **Broken Link (Target ID: Z40000117163)**
- "Servicing the Motherboard"
- "Remove the SP" on page 122
- "Install the SP" on page 123

Remove the SP

Caution - Ensure that all power is removed from the server before removing or installing the motherboard assembly. You must disconnect the power cables from the server before performing these procedures.

Caution - These procedures require that you handle components that are sensitive to ESD. This sensitivity can cause the component to fail. To avoid damage, ensure that you follow antistatic practices as described in "ESD Measures" on page 50.

Replacing the SP is a cold-service procedure that must be performed by qualified service personnel. The server must be completely powered down before performing this procedure. See "Component Service Categories" on page 53 for more information about this category of service procedures.

Before You Begin The amber SP OK/Fault LED on the front panel will be lit when an SP fault is detected.

1. **If possible, back up the Oracle ILOM configuration before removing the SP.**

   After you replace the SP, restoring the SP configuration will be easier if you previously saved the configuration using the Oracle ILOM backup utility. Refer to the Oracle ILOM documentation for instructions on backing up and restoring the Oracle ILOM configuration.

   To retain the same version of the system firmware with the new SP, note the current version before removing the SP.

2. **Prepare for servicing.**

   a. **Attach an antistatic wrist strap.**

   b. **Power off the server and unplug power cords from the power supplies.**

      See "Removing Power From the Server" on page 54.

   c. **Remove the server from the rack.**

      See "Remove the Server From the Rack" on page 61.

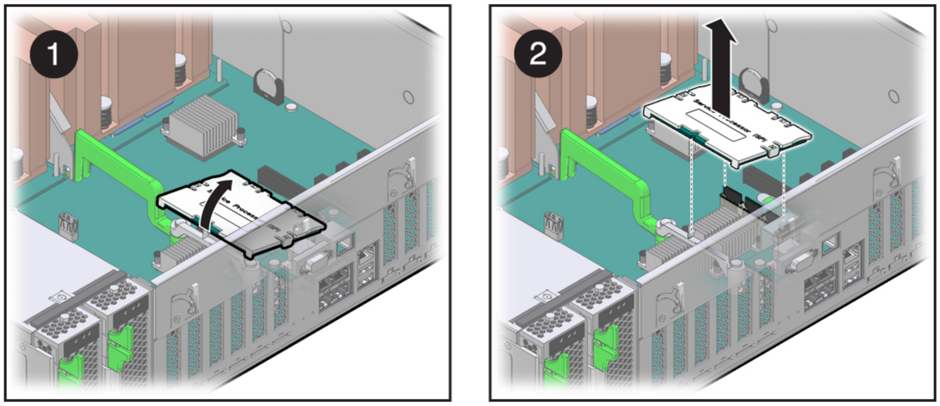
   d. **Remove the top cover.**

      See "Remove the Top Cover" on page 62.

3. **Locate the SP.**

   See "Internal Component Locations" on page 16.

4. **Remove the SP.**



Note - If you are removing the SP because you are replacing the motherboard, set the SP aside where it is protected from static. You must reinstall the SP on the new motherboard.

---

a. **Grasp the SP by the two grasp points and lift up to disengage the SP from the connectors on the motherboard (panel 1).**

b. **Lift the SP up and away from the motherboard (panel 2).**

5. **Install a new SP.**

   See "Install the SP" on page 123.

Related Information

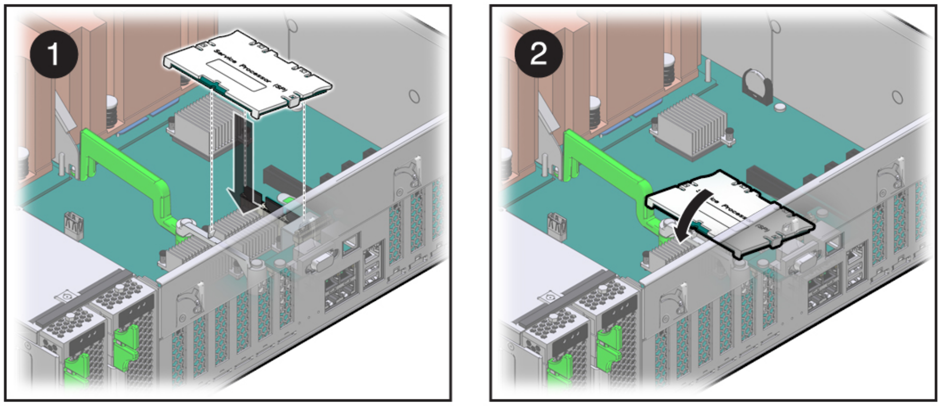
- "SP Firmware and Configuration" on page 121
- "Install the SP" on page 123

▼ Install the SP

1. **Remove the SP.**

   See "Remove the SP" on page 122.

2. **Install the SP.**



a. **Lower the side of the SP with the Align Tab sticker at an angle down on the SP tab on the motherboard (panel 1).**

b. **Press the SP straight down until it is fully seated in its socket (panel 2).**

3. **Return the server to an operational condition.**

   a. **Install the top cover.**

   See "Replace the Top Cover" on page 159.

   b. **Return the server to the normal operating position.**

   See "Return the Server to the Normal Operating Position" on page 160.

   c. **Reconnect the power cords to the power supplies.**

   See "Attach Power Cords" on page 161.

4. **Prior to powering on the server, connect a terminal or a terminal emulator (PC or workstation) to the SP SER MGT port.**

   Refer to *Server Installation* for instructions.

   If the replacement SP detects that the SP firmware is not compatible with the existing host firmware, further action will be suspended and the following message will be displayed:

```
Unrecognized Chassis: This module is installed in an unknown or
unsupported chassis. You must upgrade the firmware to a newer
version that supports this chassis.
```

Note - Whenever you replace the SP or the motherboard, update the firmware on the server so the portions of firmware in the two components remain consistent.

---

5. **Configure the SP NET MGT port so that it can access the network, and log in to the SP through the NET MGT port.**

   Refer to *Servers Administration* or the Oracle ILOM documentation for network configuration instructions.

6. **Download the system firmware.**

   Follow the firmware download instructions in *Servers Administration* or the Oracle ILOM documentation.

Note - You can load any supported system firmware version, including the firmware version that was installed prior to replacing the SP.

---

7. **If you created a backup of your Oracle ILOM configuration, use the Oracle ILOM restore utility to restore the configuration of the replacement SP.**

   Refer to the Oracle ILOM documentation for instructions.

8. **Power on the server.**

   See "Power On the Server (Oracle ILOM)" on page 162 or "Power On the Server (Power Button)" on page 162.

9. **Verify the SP.**

   See "Verify SP Functionality" on page 125.

Related Information

- Oracle ILOM documentation
- "Remove the SP" on page 122
- "Verify SP Functionality" on page 125

▼ Verify SP Functionality

1. **Verify that the SP Status LED is illuminated green.**

   Note that the LED will flash green while the SP initializes the Oracle ILOM firmware. See "Interpreting LEDs" on page 33 for information about the status of the SP LED.

2. **Use the Oracle ILOM `show faulty` command to verify that the fault has been cleared.**

See “Check for Faults” on page 43 for more information on using the `show faulty` command.

3. **Perform one of the following tasks based on your verification results:**

   - If the previous steps did not clear the fault, see “Detecting and Managing Faults” for information about the tools and methods you can use to diagnose component faults.
   - If the previous steps indicate that no faults have been detected, then the component has been replaced successfully. No further action is required.

Related Information

- Oracle ILOM documentation
- “Install the SP” on page 123

Servicing the Fan Board

This board carries power to the fan modules and fan module status LEDs. This board also transmits status and control signals for the fan modules.

These topics describe how to service the fan board.

- "Remove the Fan Board" on page 127
- "Install the Fan Board" on page 129
- "Verify Fan Board Functionality" on page 131

▼ Remove the Fan Board

Caution - These procedures require that you handle components that are sensitive to ESD. This sensitivity can cause the component to fail. To avoid damage, ensure that you follow antistatic practices as described in "ESD Measures" on page 50.

This is a cold-service procedure that must be performed by qualified service personnel. The server must be completely powered down before performing this procedure. See "Component Service Categories" on page 53 for more information about this category of service procedures.

1. **Prepare for servicing.**

   a. **Attach an antistatic wrist strap.**

   b. **Power off the server and unplug power cords from the power supplies.**

   See "Removing Power From the Server" on page 54.

   c. **Extend the server to the maintenance position.**

   See "Extend the Server to the Service Position" on page 58.

   d. **Remove the top cover.**

   See "Remove the Top Cover" on page 62.

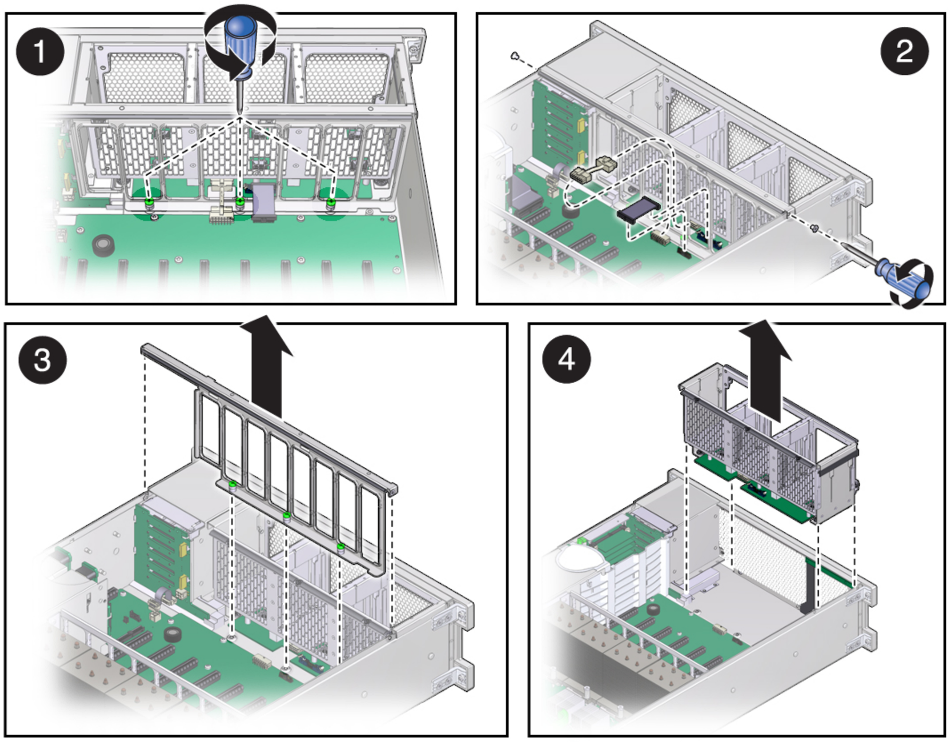
2. **Remove all fan modules.**

See “Remove a Fan Module” on page 79.

3. **Remove all memory risers.**
   See “Remove a Memory Riser and DIMM” on page 96.

4. **Disconnect any cables plugged into the USB or video connectors on the front of the server.**

5. **Remove the fan board.**



   a. **Loosen the three captive screws connecting the front memory riser guide to the motherboard (panel 1).**

   b. **Remove the two screws on each side of the outside of the chassis that hold the fan board in place and unplug the fan board and power cables from motherboard (panel 2).**

   c. **Remove the front memory riser guide by pulling it up and out of the chassis (panel 3).**

   d. **Pull the fan board back and out of chassis (panel 4).**

      The circuit board and the fan holder portions of the fan board should remain together.

6. **Install a new fan board.**

   See "Install the Fan Board" on page 129.

Related Information

- "Install the Fan Board" on page 129

▼ Install the Fan Board

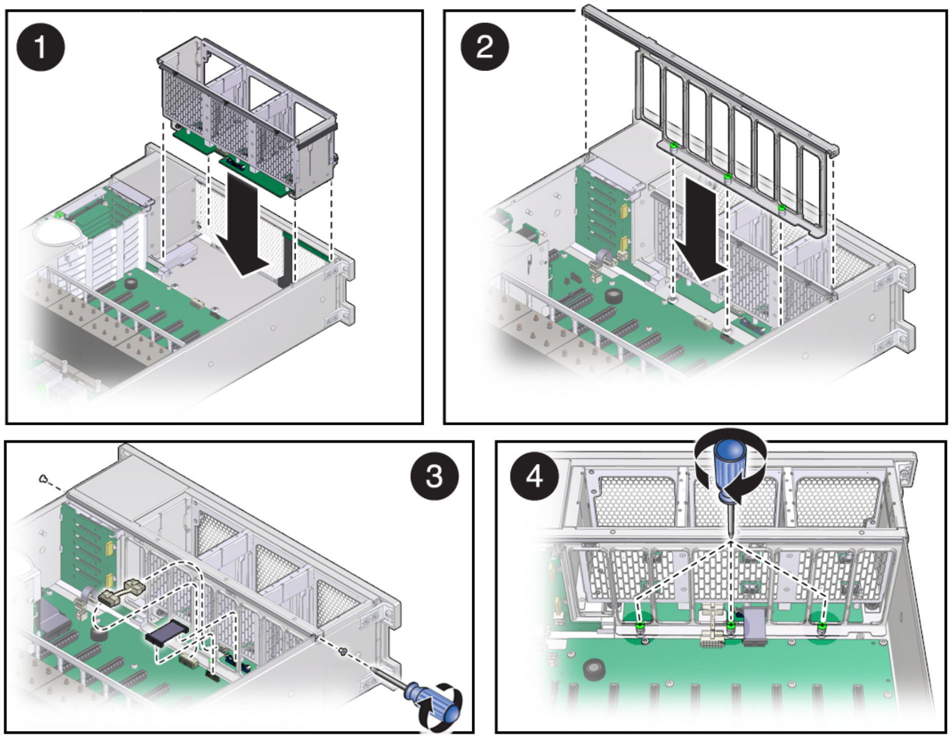
1. **Remove the fan board.**

   See "Remove the Fan Board" on page 127.

2. **Unpack the replacement fan board and place it on an antistatic mat.**

3. **Remove the fan board cable and power cables from the faulty fan board and plug the cables into the fan board on the replacement fan board.**

4. **Reinstall the fan board.**



a. **Insert the fan board into the chassis, moving it down and toward the front (panel 1).**

b. **Reposition the front memory riser guide, routing the fan board and power cable through the riser guide (panels 2 and 3).**

c. **Plug the fan board cable and power cable into the connectors on the motherboard (panel 3).**

d. **Secure the fan board by reinserting and tightening the two screws on each side of the outside of the chassis (panel 3).**

e. **Tighten the three captive screws to hold the front memory riser guide in place (panel 4).**

5. **Reinstall all fan modules.**

   See “Remove a Fan Module” on page 79.

6. **Reinstall all memory risers.**

   See "Install a DIMM and a Memory Riser" on page 99.

7. **Return the server to operation.**

   a. **Install the top cover.**

      See "Replace the Top Cover" on page 159.

   b. **Return the server to the normal operating position.**

      See "Return the Server to the Normal Operating Position" on page 160.

   c. **Reinstall the power cords to the power supplies and power on the server.**

      See "Returning the Server to Operation".

Note - Authorized service personnel might need to reprogram the product serial number on the fan board. This number is used for service entitlement and warranty coverage. The correct product serial number is located on a label on the front of the chassis.

Related Information

- "Remove the Fan Board" on page 127
- "Verify Fan Board Functionality" on page 131

▼ Verify Fan Board Functionality

1. **Use the Oracle ILOM `show faulty` command to verify that the fault has been cleared.**

   See "Check for Faults" on page 43 for more information on using the `show faulty` command.

2. **Perform one of the following tasks based on your verification results:**

   - If the previous steps did not clear the fault, see "Detecting and Managing Faults" for information about the tools and methods you can use to diagnose component faults.
   - If the previous steps indicate that no faults have been detected, then the component has been replaced successfully. No further action is required.

Servicing the Motherboard

The motherboard includes one or two CMP modules, memory control subsystems, and all SP (Oracle ILOM) logic. The motherboard hosts a removable SCC module, which contains all MAC addresses, host ID, and Oracle ILOM configuration data. The motherboard connects directly to the PS backplane, which distributes main 12V power from the power supplies to the rest of the server. The PS backplane is directly connected to the motherboard through a bus bar and ribbon cable and supports a top cover safety interlock switch.

These topics describe how to service the motherboard.

- "Remove the Motherboard" on page 133
- "Install the Motherboard" on page 138
- "Reactivate RAID Volumes" on page 144
- "Verify Motherboard Functionality" on page 146

Related Information

- "Component Service Categories" on page 53
- "Remove the Motherboard" on page 133
- "Install the Motherboard" on page 138
- "Verify Motherboard Functionality" on page 146
- "Servicing the SP"

▼ Remove the Motherboard

Caution - Ensure that all power is removed from the server before removing or installing the motherboard assembly. You must disconnect the power cables from the server before performing these procedures.

Caution - These procedures require that you handle components that are sensitive to ESD. This sensitivity can cause the component to fail. To avoid damage, ensure that you follow antistatic practices as described in "ESD Measures" on page 50.

This is a cold-service procedure that must be performed by qualified service personnel. The server must be completely powered down before performing this procedure. See “Component Service Categories” on page 53 for more information about this category of service procedures.

Note - When replacing the motherboard, remove the SP and System Configuration PROM from the old motherboard and install these components on the new motherboard. The SP contains the Oracle ILOM system configuration data, and the System Configuration PROM contains the system host ID and MAC address. Transferring these components preserves the system-specific information stored on these modules. Whenever you replace the motherboard or the SP, you must update the firmware so the portions of firmware in the SP and on the motherboard are consistent.

---

1. **Prepare for servicing.**

   a. **Attach an antistatic wrist strap.**

   b. **Power off the server and unplug power cords from the power supplies.**

      See “Removing Power From the Server” on page 54.

   c. **Remove the server from the rack.**

      See “Remove the Server From the Rack” on page 61.

   d. **Remove the top cover.**

      See “Remove the Top Cover” on page 62.

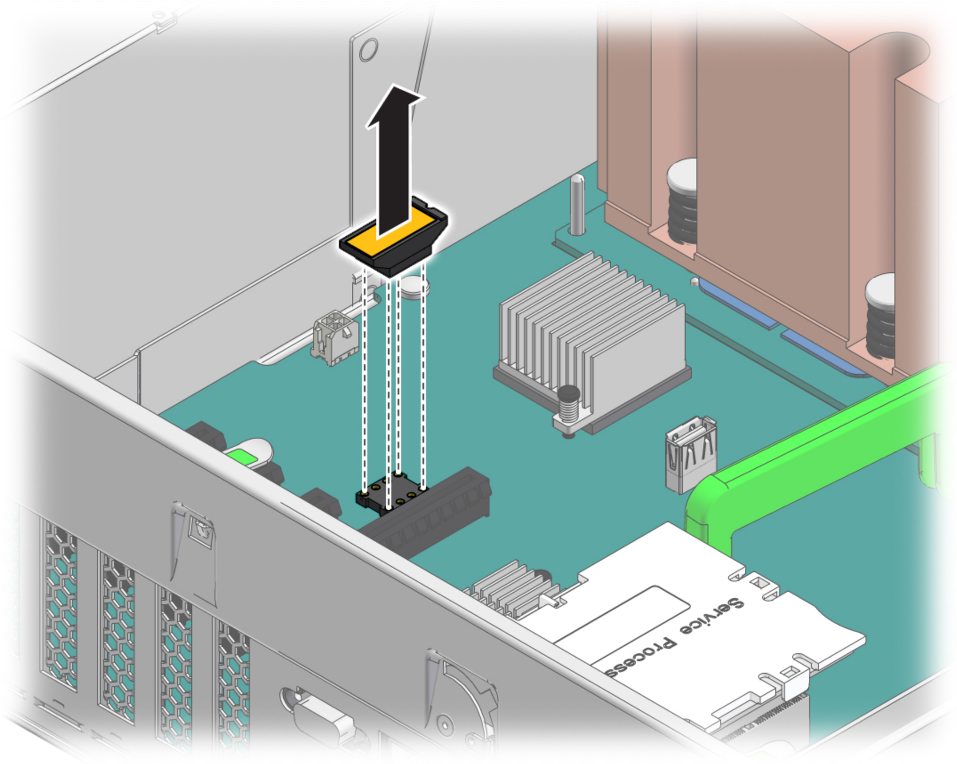
2. **Remove all PCIe cards.**

   See “Remove a PCIe Card or Filler Panel” on page 115.

   Always remove transceivers from a PCIe card before removing the card from the server.

3. **Remove the System Configuration PROM from the motherboard.**

   You will reinstall it on the new motherboard.



4. **Remove the SP.**

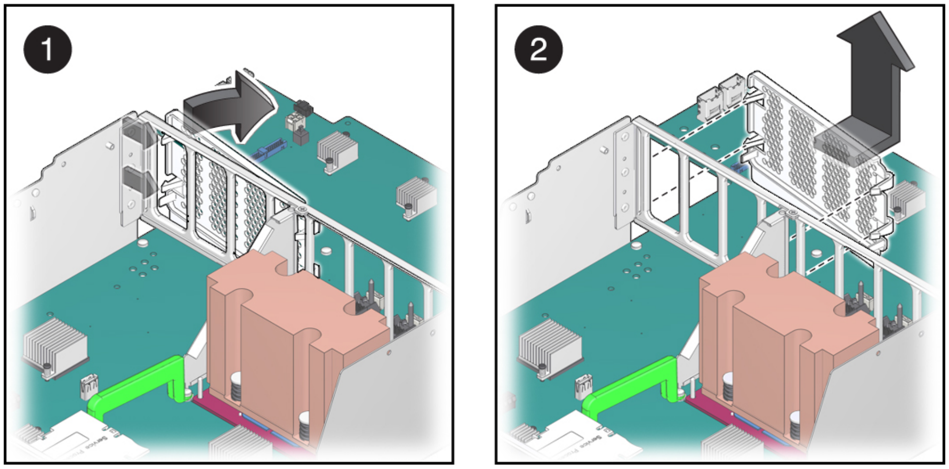
   You will reinstall the SP on the new motherboard. See "Remove the SP" on page 122.

5. **Remove all memory risers.**

   See "Remove a Memory Riser and DIMM" on page 96.

6. **On a 1-processor motherboard, remove the airflow baffle from the empty side of the center bracket.**

   Note - Save the airflow baffle to install on the new 1-processor motherboard.



   a. **On the processor side of the center bracket, lift the airflow baffle's hooks away from the edge of the center bracket (panel 1).**

   b. **Lift the airflow baffle away from the motherboard (panel 2).**

7. **Remove the System Remind button assembly (air divider) by lifting it up and away from the power supplies.**

8. **Disconnect all cables connected to the motherboard.**

   a. **Disconnect two longer cables that connect the motherboard to the drive backplane.**

      Push down a metal tab on each connector and pull up.

   b. **Disconnect two shorter cables from the motherboard.**

      One cable goes to the drive backplane. The other is a ribbon cable to the power supply.

   c. **Disconnect the fan board power cable and the ribbon cable from the motherboard.**

9. **Remove the power supply cover (panel 1).**

   You must guide two slots on the PS backplane cover around two pins on the inside of the power supply cage.

   a. **Lift the cover up a little to clear the first part of the slots.**

b. **Pull the cover a little towards the front of the chassis.**

c. **Push the tooth at the bottom of the cover to clear the edge of the power supply cage.**

d. **Lift the cover out of the chassis.**

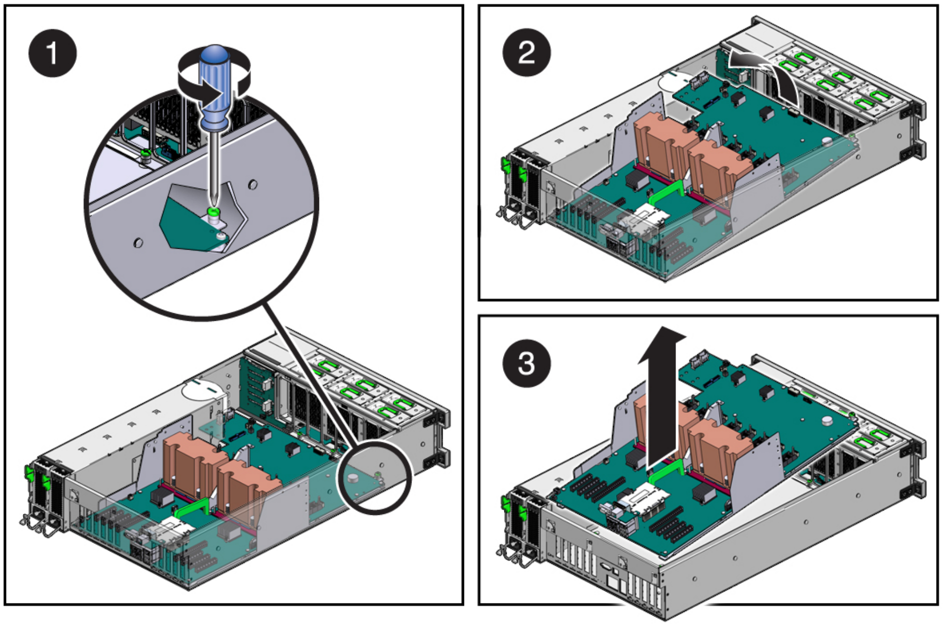
Notice the two cables that are now exposed. Be prepared to move those cables out of the way when you lift the motherboard.

10. **Remove the four bus bar screws that secure the motherboard to the PS backplane.**

    See "Remove the PS Backplane" on page 153.

11. **Position the drive end of the cables off to the side using the tab on the top of the plastic power supply cover.**

12. **Remove the motherboard.**



a. **Loosen the captive screw (in the corner near the fans) that secures the motherboard to the chassis (panel 1).**

b. **Grasp the handle on the motherboard and slide it toward the front of the chassis.**

Tilt up the end of the motherboard that is near the front of the chassis.

c. **Lift the motherboard out of the chassis.**

Ensure that remaining cables do not get caught on edges of the motherboard.

13. **Remove the service processor from the motherboard so you can reinstall it on the new motherboard.**

See "Remove the SP" on page 122.

14. **Install a new motherboard.**

See "Install the Motherboard" on page 138.

Related Information

- "Install the Motherboard" on page 138
- "Verify Motherboard Functionality" on page 146

▼ Install the Motherboard

Note - When replacing the motherboard, remove the SP and System Configuration PROM from the old motherboard and install these components on the new motherboard. The SP contains the Oracle ILOM system configuration data, and the System Configuration PROM contains the system host ID and MAC address. Transferring these components preserves the system-specific information stored on these modules. Whenever you replace the motherboard or the SP, you must update the firmware so the portions of firmware in the SP and on the motherboard are consistent.

---

1. **Unpack the replacement motherboard and place it on an antistatic mat.**

Note - On the 1-processor motherboard, do not remove the protective covering on the unused processor and memory riser areas.

---

2. **Grasp the motherboard by the handle and place it into the chassis.**

Ensure that remaining cables do not get caught on edges of the motherboard.

Set the motherboard towards the front of the chassis, then slide it toward the rear of the chassis.

3. **Tighten the captive screw (in the corner near the fans) that secures the motherboard to the chassis.**

4. **Reinsert and tighten the four bus bar screws that secure the motherboard to the PS backplane.**

   Using a No. 2 screwdriver, tighten the bus bar screws until the PS backplane and the motherboard securely fasten to the bus bars.

   See "Install the PS Backplane" on page 155.

5. **Replace the PS backplane cover (panel 3).**

   a. **Align the PS backplane cover.**

      Ensure that the tooth at the bottom of the cover is clear of the power supply cage.

      You must guide two slots on the PS backplane cover around two pins on the inside of the power supply cage.

   b. **Fit the two slots on the cover around the two pins.**

   c. **Lift up the cover a little to guide the two pins into the other part of the slots.**

   d. **Attach the screw to fasten the PS backplane cover in place.**

6. **Push the power supplies back into place.**

7. **Reattach all cables to the motherboard.**

   a. **In the center rear of the motherboard, connect the fan board power cable and the ribbon cable to the motherboard.**

   b. **Near the drives, connect two shorter cables to the motherboard.**

      One cable goes to the drive backplane. The other is a ribbon cable to the power supply.

   c. **Near the drives, connect two longer cables between the motherboard and the drive backplane.**

8. **Reinstall the System Remind button assembly (air divider) by sliding it into the chassis.**

Caution - After replacing the motherboard, inspect the gasket on the air divider before installing the air divider securely. This dividing wall maintains a pressurized seal between the server cooling zones. Without this pressurized seal, the power supply fans will not be able to draw enough air to cool the drives properly.

---

9. **Reconnect all cables from the PS backplane, drive backplane, and fan board to their original locations on the motherboard.**

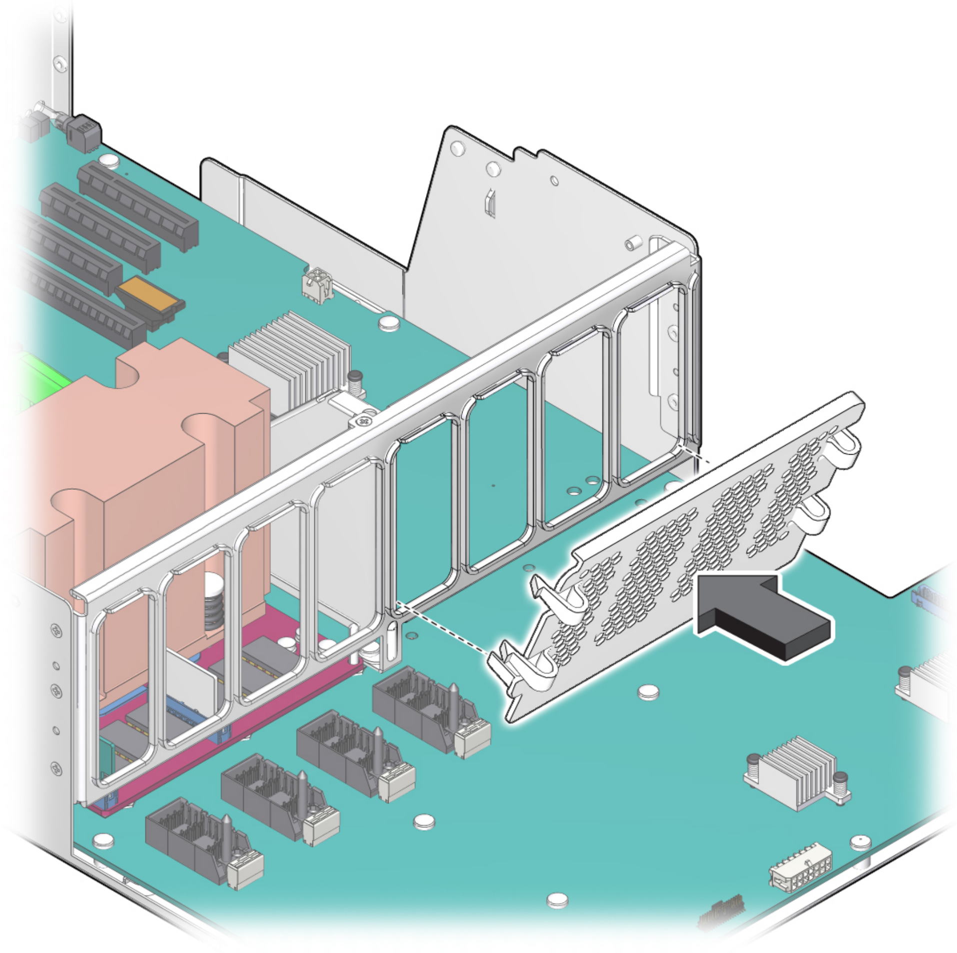
10. **On a 1-processor motherboard, attach the airflow baffle to the empty side of the center bracket.**

Note - Use the airflow baffle that you saved from the old 1-processor motherboard.

---

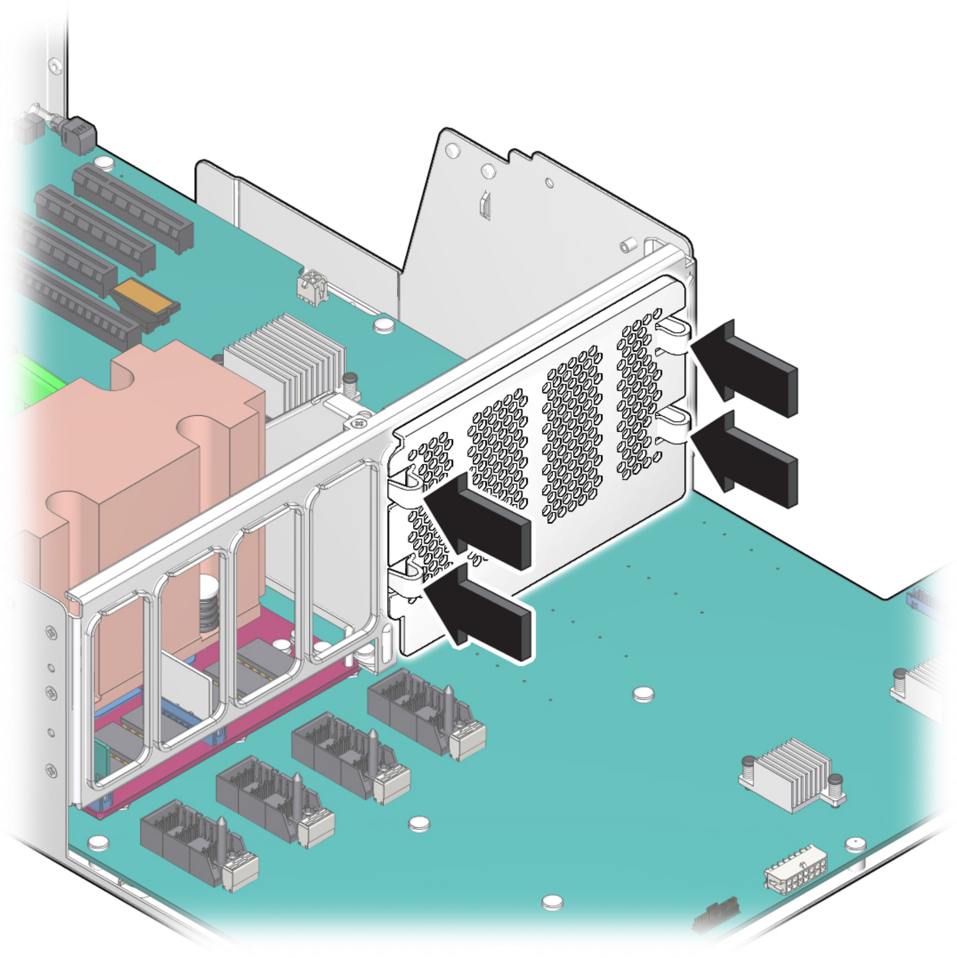
a. **On the memory riser side of the center bracket, align the airflow baffle over the four unused slots.**

The four hoops on the airflow baffle face away from the center bracket.



b. **Set the lower guide in the corner of the outer unused slots.**

c. **Press each of the four hoops until the airflow baffle's hooks snap firmly into place.**



d. **Verify that the airflow baffle is securely attached to the center bracket.**

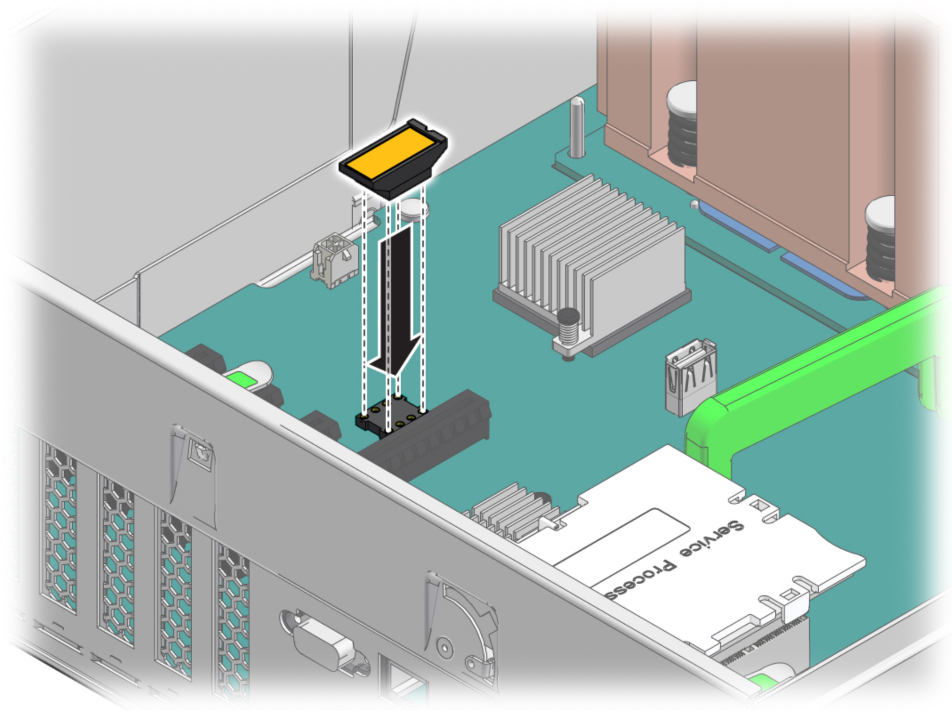
11. **Reinstall all memory risers.**

    See “Install a DIMM and a Memory Riser” on page 99.

12. **Install the SP that you removed from the old motherboard.**

    See “Install the SP” on page 123.

13. **Install the System Configuration PROM that you removed from the old motherboard.**



14. **Reinstall all PCIe cards.**

    See “Install a PCIe Card or Filler Panel” on page 117.

    Remove all transcievers from a PCIe card before you install the card.

15. **Install the top cover.**

    See “Replace the Top Cover” on page 159.

16. **Return the server to the normal operating position.**

    See “Return the Server to the Normal Operating Position” on page 160.

17. **Reconnect the power cords to the power supplies.**

    See “Attach Power Cords” on page 161.

18. **Prior to powering on the server, connect a terminal or a terminal emulator (PC or workstation) to the SP through the SER MGT port.**

    Refer to *Server Installation* for instructions.

The SP detects the host firmware on the replacement motherboard is not compatible with the existing service processor firmware, further action will be suspended and the following message will be displayed:

```
Unrecognized Chassis: This module is installed in an unknown or
unsupported chassis. You must upgrade the firmware to a newer
version that supports this chassis.
```

Note - Whenever you replace the motherboard or the SP, update the firmware on the server so the portions of firmware in the two components remain consistent.

---

19. **Prepare to download the system firmware.**

    If necessary, configure the server's NET MGT port so that it can access the network. Log in to the SP through the NET MGT port.

    Refer to the Oracle ILOM documentation for network configuration instructions.

20. **Download the system firmware.**

    Follow the firmware download instructions in the Oracle ILOM documentation.

Note - You can load any supported system firmware version, including the firmware version that was installed prior to replacing the motherboard.

---

21. **If necessary, reactivate any RAID volumes that existed prior to replacing the motherboard.**

    If your server contained RAID volumes prior to replacing the motherboard, see “Reactivate RAID Volumes” on page 144 for instructions.

22. **Power on the server.**

    See “Power On the Server (Oracle ILOM)” on page 162 or “Power On the Server (Power Button)” on page 162.

23. **(Optional) Transfer the serial number and product number to the FRUID of the new motherboard.**

    If the replacement motherboard must have the same serial number as the server prior to servicing, trained service personnel must take this action in a special service mode.

Related Information

- Oracle ILOM documentation
- “Remove the Motherboard” on page 133
- “Reactivate RAID Volumes” on page 144
- “Verify Motherboard Functionality” on page 146

▼ Reactivate RAID Volumes

Perform this task only if your server had RAID volumes prior to replacing the motherboard.

1. **Prior to powering on the server, log in to the SP.**

   Refer to *Servers Administration* for instructions.

2. **At the Oracle ILOM prompt, disable `auto-boot` so that the server will not boot the OS when the server powers on.**

   ```
   -> set /HOST/bootmode script="setenv auto-boot? false"
   ```

3. **Power on the server.**

   See "Power On the Server (Oracle ILOM)" on page 162 or "Power On the Server (Power Button)" on page 162.

4. **At the OpenBoot prompt, list the device paths on the server.**

   ```
   ok show-devs
   ...
   /pci@400/pci@2/pci@0/pci@e/scsi@0
   ...
   ```

   You can also use the `devalias` command to locate device paths specific to your server.

   ```
   ok devalias
   ...
   scsi0                    /pci@400/pci@2/pci@0/pci@e/scsi@0
   scsi                     /pci@400/pci@2/pci@0/pci@e/scsi@0
   ...
   ```

5. **Choose the RAID module on the motherboard.**

   ```
   ok select scsi
   ```

   Instead of using the alias name `scsi`, you could type the full device path name (such as `/pci@400/pci@2/pci@0/pci@e/scsi@0`).

6. **List all connected logical RAID volumes to determine which volumes are in an inactive state.**

   ```
   ok show-volumes
   ```

   For example, the following output shows an inactive volume:

   ```
   ok show-volumes
   Volume 0 Target 389  Type RAID1 (Mirroring)
     WWID 03b2999bca4dc677
     Optimal  Enabled  Inactive
     2 Members                    583983104 Blocks, 298 GB
   ```

```
  Disk 1
    Primary  Optimal
    Target 9      HITACHI  H103030SCSUN300G A2A8
  Disk 0
    Secondary  Optimal
    Target c      HITACHI  H103030SCSUN300G A2A8
```

7. **For each RAID volume listed as inactive, type the following command to activate that volume.**

   ```
   ok inactive_volume activate-volume
   ```

   where *inactive_volume* is the name of the RAID volume that you are activating. For example:

   ```
   ok 0 activate-volume
   Volume 0 is now activated
   ```

   Note - For more information on configuring hardware RAID on the server, refer to *Servers Administration*.

8. **Unselect the SCSI device.**

   ```
   ok unselect-dev
   ```

9. **Confirm that you reactivated the volume.**

   ```
   ok probe-scsi-all
   /pci@400/pci@2/pci@0/pci@e/scsi@0

   FCode Version 1.00.54, MPT Version 2.00, Firmware Version 5.00.17.00

   Target a
     Unit 0   Removable Read Only device   TEAC    DV-W28SS-R      1.0C
     SATA device  PhyNum 3
   Target b
   GB  Unit 0   Disk   SEAGATE  ST914603SSUN146G 0868    286739329 Blocks, 146
     SASDeviceName 5000c50016f75e4f  SASAddress 5000c50016f75e4d  PhyNum 1
   Target 389 Volume 0
     Unit 0   Disk   LSI      Logical Volume   3000    583983104 Blocks, 298 GB
     VolumeDeviceName 33b2999bca4dc677  VolumeWWID 03b2999bca4dc677

   /pci@400/pci@1/pci@0/pci@b/pci@0/usb@0,2/hub@2/hub@3/storage@2
     Unit 0   Removable Read Only device    AMI     Virtual CDROM   1.00
   ```

10. **Set the `auto-boot?` OpenBoot PROM variable to `true` so the server boots the OS when powered on.**

    ```
    ok setenv auto-boot? true
    ```

11. **Reboot the server.**

    See *Server Administration*.

Related Information

- “Install the Motherboard” on page 138
- “Verify Motherboard Functionality” on page 146

▼ Verify Motherboard Functionality

1. **Use the Oracle ILOM `show faulty` command to verify that the fault has been cleared.**

   See “Check for Faults” on page 43 for more information on using the `show faulty` command.

2. **Perform one of the following tasks based on your verification results:**

   - If the previous steps did not clear the fault, see “Detecting and Managing Faults” for information about the tools and methods you can use to diagnose component faults.
   - If the previous steps indicate that no faults have been detected, then the component has been replaced successfully. No further action is required.

Related Information

- “Install the Motherboard” on page 138
- “Reactivate RAID Volumes” on page 144

Servicing the Drive Backplane

This board provides connectors for the drive signal cables. This board also serves as the interconnect for the front I/O board, the Power and Locator buttons, and server or component status LEDs.

These topics describe how to service the drive backplane.

- "Remove the Drive Backplane" on page 147
- "Install the Drive Backplane" on page 149
- "Verify Drive Backplane Functionality" on page 151

▼ Remove the Drive Backplane

This is a cold-service procedure that must be performed by qualified service personnel. The server must be completely powered down before performing this procedure. See "Component Service Categories" on page 53 for more information about this category of service procedures.

1. **Prepare for servicing.**

   a. **Attach an antistatic wrist strap.**

   b. **Power off the server and unplug power cords from the power supplies.**

   See "Removing Power From the Server" on page 54.

   c. **Remove the server from the rack.**

   See "Remove the Server From the Rack" on page 61.

   d. **Remove the top cover.**

   See "Remove the Top Cover" on page 62.

2. **Remove all drives and fillers.**

   See "Remove a Drive" on page 67.

Note - Note the positions of the drives so you can return them to the correct slots.

---

3. **Remove the DVD drive.**

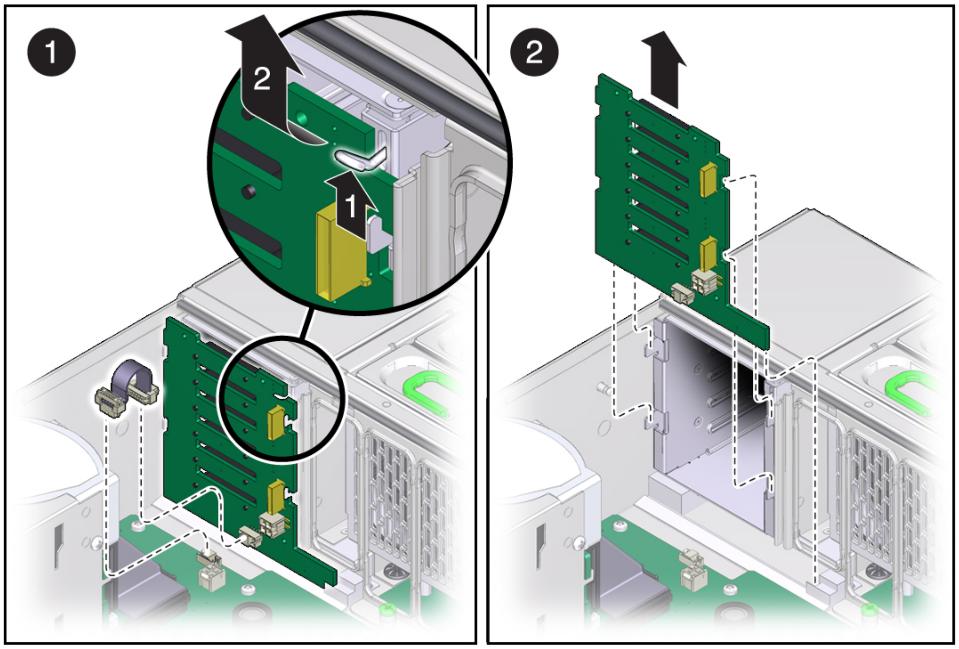
   See "Remove a DVD Drive or Filler Panel" on page 105.

4. **Remove one or more memory risers to have easier access to components in the drive area.**

   See "Remove a Memory Riser and DIMM" on page 96.

5. **Remove the System Remind button assembly (air divider) by lifting it up and away from the power supplies.**

6. **Remove the drive backplane.**



   a. **Unplug the two SAS cables, power cables, and ribbon cable from the drive backplane (panel 1).**

   b. **Push up on the wire tab in the upper corner of the drive backplane (panel 1).**

   c. **Swing the drive backplane back and out of the chassis (panel 2).**

7. **Install a new drive backplane.**

   See "Install the Drive Backplane" on page 149.

Related Information

- "Install the Drive Backplane" on page 149

▼ Install the Drive Backplane

1. **Remove the drive backplane.**

   See "Remove the Drive Backplane" on page 147.

2. **Unpack the replacement drive backplane and place it on an antistatic mat.**

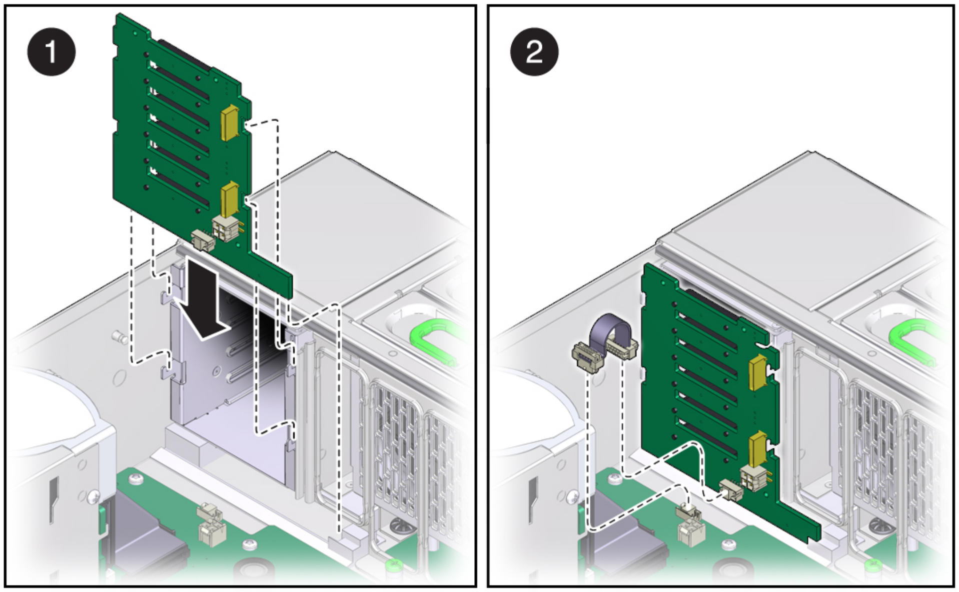
3. **Insert the drive backplane into the chassis.**

   Verify that the drive backplane is seated properly at the bottom, in the small slot near the DVD drive.

4. **Lift up the metal hook and press the drive backplane to the front until it snaps into place.**

5. **Replace the power cable, ribbon data cable, and SAS cables to their original locations.**

Note - You must insert the mini-SAS plug into the upper mini-SAS connector on the drive backplane. This short cable connects the DVD drive to its USB bridge on the motherboard. The longer SAS cable connects drive bays 4 and 5 to a storage device in the rear of the server. The lower mini-SAS connector on the disk backplane requires the standard, four-channel mini-SAS cable for drive bays 0 to 3.



6. **Replace the System Remind button assembly (air divider).**

7. **Replace all memory risers you removed.**

   See “Install a DIMM and a Memory Riser” on page 99.

8. **Replace the DVD drive.**

   See “Install a DVD Drive or Filler Panel” on page 106.

9. **Replace all drives and filler panels.**

   See “Install a Drive” on page 71.

10. **Return the server to operation.**

    a. **Install the top cover.**

       See “Replace the Top Cover” on page 159.

    b. **Return the server to the normal operating position.**

       See “Return the Server to the Normal Operating Position” on page 160.

    c. **Power on the server.**

       See “Returning the Server to Operation”.

Note - Authorized service personnel might need to reprogram the product serial number on the drive backplane. This number is used for service entitlement and warranty coverage. The correct product serial number is located on a label on the front of the chassis.

Related Information

- "Remove the Drive Backplane" on page 147
- "Verify Drive Backplane Functionality" on page 151

▼ Verify Drive Backplane Functionality

1. **Use the Oracle ILOM `show faulty` command to verify that the fault has been cleared.**

   See "Check for Faults" on page 43 for more information on using the `show faulty` command.

2. **Perform one of the following tasks based on your verification results:**

   - If the previous steps did not clear the fault, see "Detecting and Managing Faults" for information about the tools and methods you can use to diagnose component faults.
   - If the previous steps indicate that no faults have been detected, then the component has been replaced successfully. No further action is required.

Related Information

- "Remove the Drive Backplane" on page 147
- "Install the Drive Backplane" on page 149

Servicing the PS Backplane

This board carries 12V power from the power supplies to the motherboard over a pair of bus bars. The power supplies connect directly to the PS backplane.

These topics describe how to service the PS backplane.

- "Remove the PS Backplane" on page 153
- "Install the PS Backplane" on page 155
- "Verify PS Backplane Functionality" on page 157

Remove the PS Backplane

Caution - Power is supplied to the PS backplane even when the server is powered off. To avoid personal injury or damage to the server, you must disconnect power cords before servicing the PS backplane.

This is a cold-service procedure that must be performed by qualified service personnel. The server must be completely powered down before performing this procedure. See "Component Service Categories" on page 53 for more information about this category of service procedures.

1. **Prepare for servicing.**
   1. **Attach an antistatic wrist strap.**
   2. **Power off the server and unplug power cords from the power supplies.**
      See "Removing Power From the Server" on page 54.
   3. **Extend the server to the maintenance position.**
      See "Extend the Server to the Service Position" on page 58.
   4. **Remove the top cover.**
      See "Remove the Top Cover" on page 62.
2. **Pull both power supplies at least part-way out of the chassis, to disconnect them from the PS backplane.**

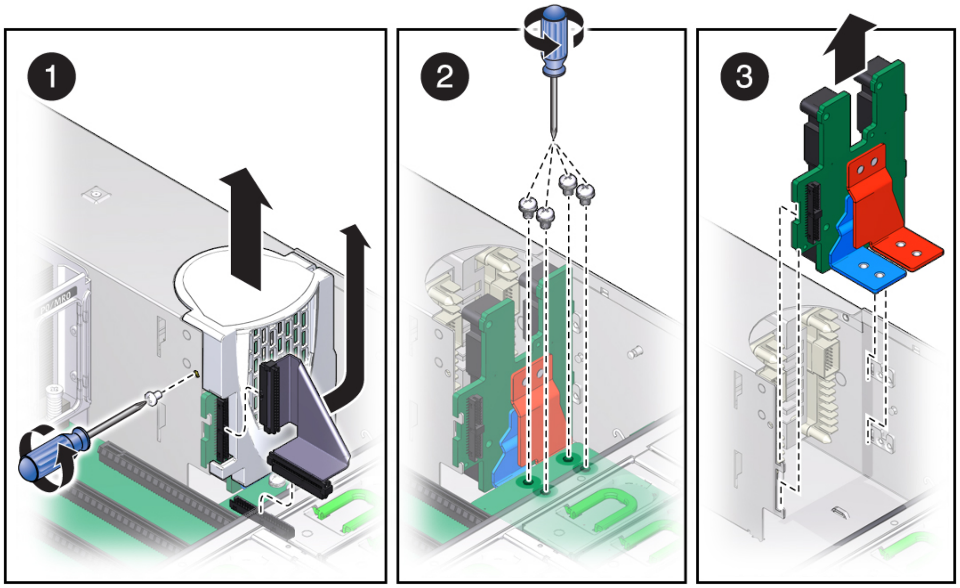
See “Remove a Power Supply” on page 87.

3. **Remove all memory risers.**

   See “Remove a Memory Riser and DIMM” on page 96.

4. **Remove the air divider by pulling it up and out of the chassis.**

5. **Remove the ribbon cable connecting the PS backplane to the motherboard (panel 1).**



6. **Remove the screw that holds the PS backplane cover in place (panel 1).**

7. **Remove the PS backplane cover (panel 1).**

   You must guide two slots on the PS backplane cover around two pins on the inside of the power supply cage.

   a. **Lift the cover up a little to clear the first part of the slots.**

   b. **Push the cover a little towards the front of the chassis.**

   c. **Push the tooth at the bottom of the cover to clear the edge of the power supply cage.**

   d. **Lift the cover out of the chassis.**

8. **Remove the four bus bar screws that secure the motherboard to the PS backplane.**

9. **Disconnect the AC cables from PS backplane.**

   Tilt the PS backplane to access the cable connectors.

10. **Lift the PS backplane out of the chassis.**

11. **Install a new PS backplane.**

    See "Install the PS Backplane" on page 155.

Related Information

- "Install the PS Backplane" on page 155.

▼ Install the PS Backplane

1. **Remove the PS backplane.**

   See "Remove the PS Backplane" on page 153.

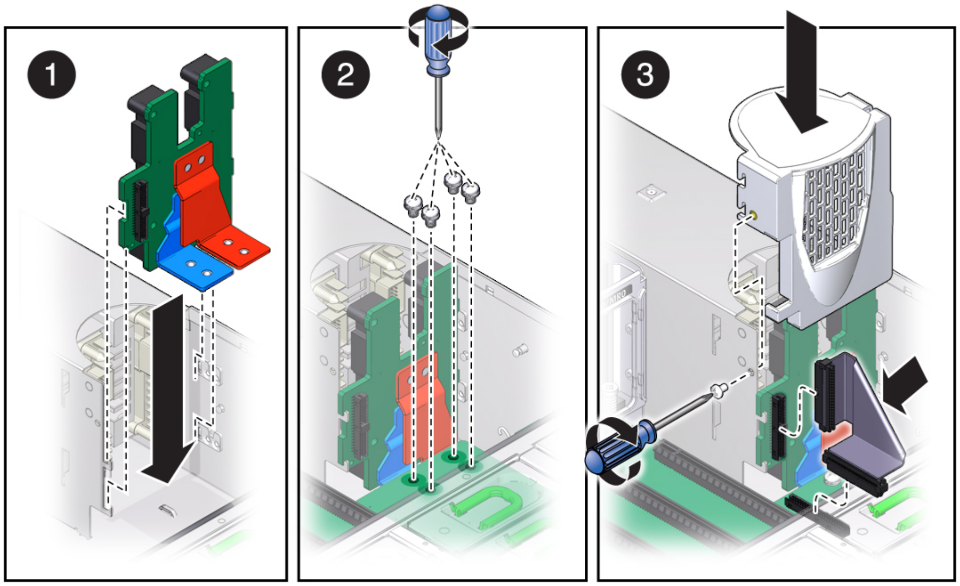
2. **Unpack the replacement PS backplane and place it on an antistatic mat.**

3. **Hold the PS backplane at the end of the power supply cage at an angle, and connect the AC cables to the AC connectors on the PS backplane.**

   Ensure that each AC cable is connected to the appropriate connector. You must connect the AC cable on the right to the AC connector on the right, and connect the AC cable on the left to the AC connector on the left.

4. **Insert the PS backplane into position (panel 1).**

   Ensure that the tabs on the power board slide onto the hooks on the power supply cage.



5. **Install the four bus bar screws to secure the mother board to the PS backplane (panel 2).**

   Use a No. 2 Phillips screwdriver to tighten the bus bar screws until the PS backplane and the motherboard are securely fastened to the bus bars.

6. **Replace the PS backplane cover (panel 3).**

   a. **Align the PS backplane cover.**

      Ensure that the tooth at the bottom of the cover is clear of the power supply cage.

      You must guide two slots on the PS backplane cover around two pins on the inside of the power supply cage.

   b. **Fit the two slots on the cover around the two pins.**

   c. **Lift up the cover a little to guide the two pins into the other part of the slots.**

   d. **Attach the screw to fasten the PS backplane cover in place.**

7. **Reconnect the ribbon cable from the motherboard to the PS backplane (panel 3).**

8. **Reinstall the air divider by sliding it into the chassis.**

9. **Reinstall the memory risers.**

   See “Install a DIMM and a Memory Riser” on page 99.

10. **Push the power supplies all the way back into the chassis.**

    See “Install a Power Supply” on page 89.

11. **Return the server to operation.**

    a. **Install the top cover.**

       See “Replace the Top Cover” on page 159.

    b. **Return the server to the normal operating position.**

       See “Return the Server to the Normal Operating Position” on page 160.

    c. **Reinstall the power cords to the power supplies and power on the server.**

       See “Returning the Server to Operation”.

Related Information

- “Remove the PS Backplane” on page 153
- “Verify PS Backplane Functionality” on page 157

Verify PS Backplane Functionality

1. **Use the Oracle ILOM `show faulty` command to verify that the fault has been cleared.**

   See “Check for Faults” on page 43 for more information on using the `show faulty` command.

2. **Perform one of the following tasks based on your verification results:**

   - If the previous steps did not clear the fault, see “Detecting and Managing Faults” for information about the tools and methods you can use to diagnose component faults.
   - If the previous steps indicate that no faults have been detected, then the component has been replaced successfully. No further action is required.

Related Information

- “Remove the PS Backplane” on page 153
- “Install the PS Backplane” on page 155

Returning the Server to Operation

These topics describe how to return the server to operation.

Step	Description	Links
1.	Replace the top cover and return the server to its normal operating position	“Replace the Top Cover” on page 159 “Return the Server to the Normal Operating Position” on page 160
2.	Connect the power cords to the server.	“Attach Power Cords” on page 161
3.	Power on the server.	“Power On the Server (Oracle ILOM)” on page 162 “Power On the Server (Power Button)” on page 162

▼ Replace the Top Cover

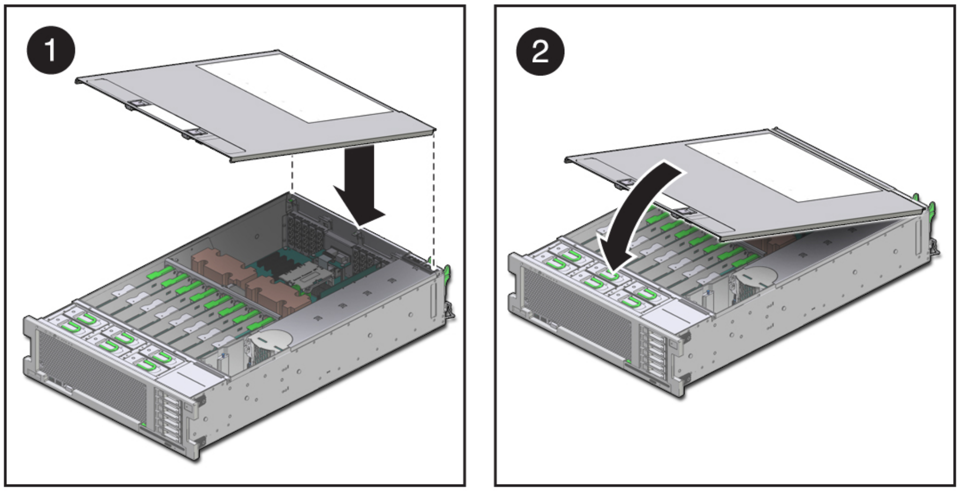
1. **Place the top cover on the chassis (panel 1).**

   A metal air baffle is attached to the rear inside surface of the top cover. When you place the top cover on the server, ensure that the air baffle does not catch on anything inside the server.

   Set the cover down so that it is about 1 inch (2.5 cm) forward of the rear of the server.

2. **Slide the top cover toward the rear of the chassis until the rear cover lip engages with the rear of the chassis.**

3. **Close the top cover by pressing down on the cover with both hands until both latches engage.**



Related Information

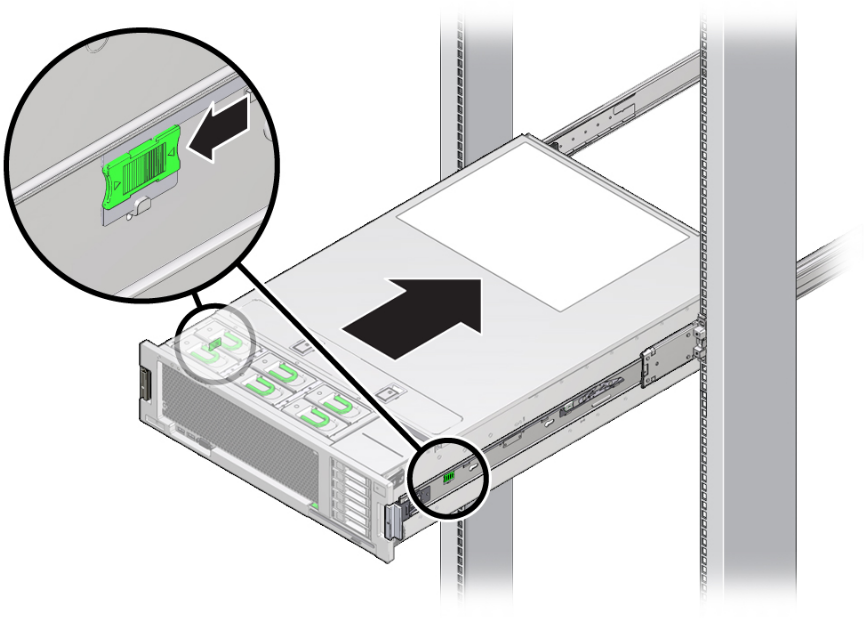
- “Remove the Top Cover” on page 62

Return the Server to the Normal Operating Position

Before You Begin

Caution - The chassis is heavy. To avoid personal injury, use two people to lift the server and set it in the rack.

1. **Release the slide rails from the fully extended position by pushing the release tabs on the side of each rail.**



2. **While pushing on the release tabs, slowly push the server into the rack.**

   Ensure that the cables do not get in the way.

3. **Reconnect the cables to the rear of the server.**

   If the CMA is in the way, disconnect the left CMA release and swing the CMA open. See "Release the CMA" on page 60.

4. **Reconnect the CMA.**

   Swing the CMA closed and latch it to the left rack rail. See *Server Installation* for more detail about attaching the CMA.

Related Information

- "Remove the Server From the Rack" on page 61

▼ Attach Power Cords

1. **Attach both power cords to the power supplies.**

Note - As soon as the power cords are connected to a power source, standby power is applied in the server. Depending on how the firmware is configured, the server might boot at this time.

---

2. **Power on the server.**

   See “Power On the Server (Oracle ILOM)” on page 162 or “Power On the Server (Power Button)” on page 162.

Related Information

- “Power On the Server (Oracle ILOM)” on page 162
- “Power On the Server (Power Button)” on page 162

Power On the Server (Oracle ILOM)

Before You Begin

Note - If you are powering on the server following an emergency shutdown that was triggered by the top cover interlock switch, you must use the `poweron` command.

- **Type `poweron` at the Oracle ILOM prompt.**

```
-> poweron
```

You will see an `alert` message on the system console. This message indicates that the server is reset. You will also see a message indicating that the VCORE has been margined up to the value specified in the default `.scr` file that was previously configured. For example:

```
-> start /System
```

Related Information

- “Power On the Server (Power Button)” on page 162

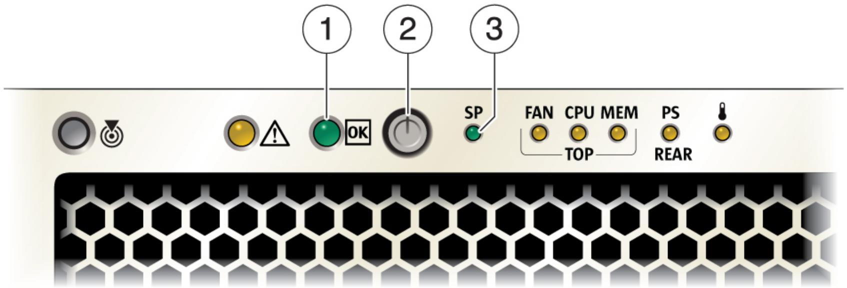
Power On the Server (Power Button)

Caution - Do not operate the server without all fans, component heat sinks, air baffles, fillers, and the cover installed. Severe damage to server components can occur if the server is operated without adequate cooling mechanisms.

---

1. **Verify that the power cords are connected and that standby power is on.**

   Shortly after power is applied to the server, the SP OK/Fault LED blinks as the SP boots. The SP OK/Fault LED is illuminated solid green when the SP has successfully booted. After the SP has booted, the Power OK/LED on the front panel begins flashing slowly, indicating that the host is in standby power mode.



2. **Press and release the recessed power button on the server front panel.**

FIgure	**Legend**
1	Power/OK LED
2	Power button
3	SP OK Fault LED

When main power is applied to the server, the main Power/OK LED begins to blink more quickly while the server boots and lights solidly once the operating system boots.

Each time the server powers on, POST can take several minutes to complete tests.

Related Information

- "Power On the Server (Oracle ILOM)" on page 162

Glossary

A

ANSI SIS	American National Standards Institute Status Indicator Standard.
ASF	Alert standard format (Netra products only).
AWG	American wire gauge.

B

blade	Generic term for server modules and storage modules. *See* server module *and* storage module.
blade server	Server module. See server module.
BMC	Baseboard management controller.
BOB	Memory buffer on board.

C

chassis	For servers, refers to the server enclosure. For server modules, refers to the modular system enclosure.
CMA	Cable management assembly.
CMM	Chassis monitoring module (server modules only). The CMM is the service processor in the modular system that contains server modules. Oracle ILOM runs on the CMM, providing lights out management of the components in the modular system chassis. *See* modular system *and* Oracle ILOM.
CMP	Chip multiprocessor.

D

DHCP	Dynamic Host Configuration Protocol.
disk module or disk blade	Interchangeable terms for storage module. *See* storage module.
DTE	Data terminal equipment.

E

EIA	Electronics Industries Alliance.
ESD	Electrostatic discharge.

F

FEM	Fabric expansion module (server modules only). FEMs enable server modules to use the 10GbE connections provided by certain NEMs. *See* NEM.
FRU	Field-replaceable unit.

H

HBA	Host bus adapter.
host	The part of the server or server module with the CPU and other hardware that runs the Oracle Solaris OS and other applications. The term *host* is used to distinguish the primary computer from the SP. *See* SP.
hot-pluggable	Describes a component that can be replaced with power applied, but the component must be prepared for removal.
hot-swappable	Describes a component that can be replaced with power applied, and no preparation is required.

I

ID PROM	Chip that contains system information for the server or server module.
IP	Internet Protocol.

K

KVM	Keyboard, video, mouse. Refers to using a switch to enable sharing of one keyboard, one display, and one mouse with more than one computer.

L

LwA	Sound power level.

M

MAC	Machine access code.
MAC address	Media access controller address.
modular system	The rackmountable chassis that holds server modules, storage modules, NEMs, and PCI EMs (server modules only). The modular system provides Oracle ILOM through its CMM.
MSGID	Message identifier.

N

name space	Top-level Oracle ILOM target.
NEBS	Network Equipment-Building System (Netra products only).
NEM	Network express module (server modules only). NEMs provide Ethernet and SAS connectivity to storage modules.
NET MGT	Network management port. An Ethernet port on the server SP, the server module SP, and the CMM.
NIC	Network interface card or controller.
NMI	Nonmaskable interrupt.

O

OBP	OpenBoot PROM. Sometimes OBP is used in file names and messages to indicate a relationship to OpenBoot.

Oracle ILOM	Oracle Integrated Lights Out Manager. Oracle ILOM firmware is preinstalled on a variety of Oracle systems. Oracle ILOM enables you to remotely manage your Oracle servers regardless of the state of the host system.
Oracle ILOM CMM	Oracle ILOM that runs on the CMM (server modules only). *See* Oracle ILOM.
Oracle Solaris OS	Oracle Solaris operating system.

P

PCI	Peripheral component interconnect.
PEM	PCIe ExpressModule (server modules only). Modular components that are based on the PCI Express industry-standard form factor and offer I/O features such as Gigabit Ethernet and Fibre Channel.
POST	Power-on self-test.
PROM	Programmable read-only memory.
PSH	Predictive self healing.

R

REM	RAID expansion module (server modules only). Sometimes referred to as an HBA *See* HBA. Supports the creation of RAID volumes on drives.

S

SAS	Serial attached SCSI.
SCC	System configuration chip.
SER MGT	Serial management port. A serial port on the server SP, the server module SP, and the CMM.
server module	Modular component that provides the main compute resources (CPU and memory) in a modular system. Server modules also might have on-board storage and connectors that hold FEMs.
SP	Service processor. In the server or server module, the SP is a card with its own OS. The SP processes Oracle ILOM commands providing lights out management control of the host. *See* host.

SSD	Solid-state drive.
SSH	Secure shell.
storage module	Modular component that provides computing storage to the server modules.

T

TIA	Telecommunications Industry Association (Netra products only).
Tma	Maximum ambient temperature.

U

U.S. NEC	United States National Electrical Code.
UCP	Universal connector port.
UI	User interface.
UL	Underwriters Laboratory Inc.
UTC	Coordinated Universal Time.
UUID	Universal unique identifier.

W

WWN	World wide name. A unique number that identifies a SAS target.

Index

A

AC OK LED, location of, 15
airflow baffle
  removing, 133

B

battery
  installing, 110
  removing, 109

C

`cfgadm` command, 74
chassis serial number, locating, 52
clearing faults
  PSH-detected faults, 45
CMA
  releasing left side, 60
CMP, physical layout, 91
cold service, 53
component service categories, 53
configuring
  PCIe cards, 113
configuring how POST runs, 40
controls
  front panel, 34

D

`diag_level` parameter, 38
`diag_mode` parameter, 38
`diag_trigger` parameter, 39
`diag_verbosity` parameter, 39
diagnostics
  low-level, 38
DIMMs
  classification labels, 94
  enabling new, 102
  FRU names, 91
  installing, 99
  locating faulty
    LEDs, 94
    Oracle ILOM, 96
  physical layout, 91
  removing, 96
`dmesg` command, 46
drive backplane
  installing, 149
  removing, 147
  verifying function of replaced, 151
drives
  about, 65
  filler panels
    installing, 73
    removing, 70
  installing, 71
  removing, 67
  verifying function of replaced, 74
DVD drive or filler panel
  installing, 106
  removing, 105

E

enabling new DIMMs, 102
ESD, preventing, 50
Ethernet cables, connecting, 63
external cables, connecting, 63

F
- failed *See* faulted
- fan board
  - installing, 129
  - removing, 127
  - verifying function of replaced, 131
- Fan Module Fault LED, 34
- fan modules
  - installing, 81
  - LEDs, location of, 13
  - locating faulty, 78
  - removing, 79
  - verifying function of replaced, 82
- Fault Remind button
  - on air divider, 97
  - on memory riser, 98
- faulted
  - DIMMs, locating (Oracle ILOM), 96
  - power supplies, locating, 87
- faults
  - detecting and managing, 29
  - PSH-detected
    - checking for, 43
- faulty
  - DIMMs, locating (LEDs), 94
- filler panels
  - installing
    - drives, 73
    - DVD drive, 106
  - removing
    - drives, 70
    - DVD drive, 105
- `fmadm` command, 45
- `fmdump` command, 43
- front panel controls and LEDs, 34
- front panel features, location of, 13

G
- graceful shutdown, defined, 56

H
- HD-15 video connector, location of, 15
- hot service, 53

I
- installing
  - battery, 110
  - DIMMs, 99
  - drive backplane, 149
  - drive filler panels, 73
  - drives, 71
  - DVD drive or filler panel, 106
  - fan board, 129
  - fan modules, 81
  - memory risers, 99
  - motherboard, 138
  - PCIe cards, 117
  - power supplies, 89
  - PS backplane, 155
  - SP, 123
  - top cover, 159

L
- LEDs
  - Fan Module Fault, 34
  - front panel, 34
  - Locator, 34, 36, 52
  - NET MGT port Link and Activity, 36
  - NET MGT port Speed, 36
  - NET ports Link and Activity, 36
  - on front panel, 13
  - on rear panel, 15
  - Overtemperature, 13, 34
  - Overtemperature LED, 36
  - Power OK, 34, 36
  - Power Supply Fault, 13
  - Service Required, 34, 36
  - SP fault, 13
- locating
  - chassis serial number, 52
  - faulty
    - DIMMs (with LEDs), 94
    - DIMMs (with Oracle ILOM), 96
    - fan modules, 78
    - power supplies, 87
  - server, 52
- location of replaceable components, 16
- Locator LED, 34, 36
- Locator LED and button, location of, 13

log files
  viewing, 47

M

MAC address PROM
  installing, 142
  removing, 134
maintenance position, 61
maximum testing with POST, 42
memory risers
  FRU names, 91
  installing, 99
  physical layout, 91
  population rules, 93
  removing, 96
message buffer, checking the, 46
message identifier, 43
message log files, viewing, 47
motherboard
  installing, 138
  reactivate RAID volumes, 144
  removing, 133
  verifying function of replaced, 146

N

NET MGT port Link and Activity LED, 36
NET MGT port Speed LED, 36
NET ports Link and Activity LED, 36
network (NET) ports, location of, 15

O

Oracle ILOM
  locating failed DIMMs, 96
Oracle Solaris
  files and commands, 46
Oracle Solaris PSH
  checking for faults, 43
  clearing faults, 45
  overview, 43
Oracle VTS
  using for fault diagnosis, 29
Overtemperature LED, 34, 36
Overtemperature LED, location of, 13

P

PCIe cards
  configuration rules, 113
  installing, 117
  removing, 115
  root complex paths, 114
  slot locations, 15, 15
physical layout
  CMP, memory risers, DIMMs, 91
populating memory risers, 93
POST
  about, 38
  configuration examples, 40
  configuring, 40
  running in Diag Mode, 42
Power button, 34
Power button, location of, 13
Power OK LED, 34, 36
power supplies
  fault LED, location of, 13
  installing, 89
  locating faulted, 87
  removing, 87
  verifying function of replaced, 90
Power Supply Fail LED, location of, 15
Power Supply OK LED, location of, 15
power-on self-test, see POST, 38
PS backplane
  installing, 155
  removing, 153
  verifying function of replaced, 157
PSH Knowledge article web site, 43

R

RAID
  reactivate RAID volumes, 144
removing
  airflow baffle, 133
  battery, 109
  DIMMs, 96
  drive backplane, 147
  drive filler panels, 70

  - drives, 67
  - DVD drive or filler panel, 105
  - fan board, 127
  - fan modules, 79
  - memory risers, 96
  - motherboard, 133
  - PCIe cards, 115
  - power supplies, 87
  - PS backplane, 153
  - SP, 122
  - top cover, 62
- replaceable component locations, 16
- RJ-45 serial port, location of, 15
- root complex, 114
- running POST in Diag Mode, 42

S
- safety
  - information topics, 49
  - precautions, 49
  - symbols, 50
- schematic diagrams, 23
- SER MGT port
  - location of, 15
- serial number (chassis), locating, 52
- server
  - locating, 52
- Service Action Required LED, 13
- Service Required LED, 34, 36
- `show faulty` command, 45
- slide rail, 58
- SP
  - fault LED, location of, 13
  - installing, 123
  - NET MGT port, 15
  - removing, 122
  - verifying function, 125
- standby power, defined, 56
- status LEDs, locations of, 15
- symbols, safety, 50
- system schematics, 23

T
- top cover
  - installing, 159
  - removing, 62
- troubleshooting
  - using Oracle VTS, 29

U
- USB ports
  - location of
    - front, 13
    - rear, 15
- UUID, 43

V
- `/var/adm/messages` file, 47
- verifying function of replaced
  - drive backplane, 151
  - drives, 74
  - fan board, 131
  - fan modules, 82
  - motherboard, 146
  - power supplies, 90
  - PS backplane, 157
  - SP, 125
- video connector
  - location of, 13
- viewing message log files, 47